Montville Power LLC
Montville Generating Station
74 Lathrop Road
Uncasville, CT 06382

February 24, 2016

Ms. Jessica Stefanowicz
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, Connecticut 06106

Subject: Montville Power LLC Groundwater Remedial Action Plan Submittal

Reference: Letter - Connecticut Department of Energy and Environmental Protection **(CTDEEP) to Montville Power LLC dated August 25, 2015 disapproving reconsideration of the prior approval and evaluation of six potential options for methodologies on calculating a different Alternative Surface Water Protection Criteria (ASWPC) for arsenic.**

Dear Ms. Stefanowicz:

Montville Power LLC (Montville) hereby submits this groundwater remedial action plan (RAP) as requested in the CTDEEP letter dated August 25, 2015.

Montville submits this RAP in order to meet the schedule outlined in the referenced letter – and amended in a December 2015 email. Montville requests further information on the basis of the disapproval of the alternative ASWPC methodologies which was the subject of the referenced letter.

Montville and its affiliate companies have been actively completing remediation projects across our Connecticut fleet and has demonstrated a willingness to invest in these projects to bring closure to our Connecticut Transfer Act obligations. We were encouraged in August 2013 to hear the CTDEEP recommend that we petition for a reconsideration of the prior ASWPC approval as this would be consistent with the remediation findings in the approved Ecological Risk Assessment. We were disappointed when our request for reconsideration was disapproved. We believe the calculations submitted in the Notice of Revised ASWPC on January 9, 2009 are consistent with methodologies accepted by the DEEP, and feel that our proposed arsenic target level of 27 ug/l is more appropriate for this site.

This RAP documents a process which we believe will decrease arsenic contamination in the groundwater to less than the approved ASWPC of 10ug/l however, we request additional opportunities to meet with CTDEEP staff to better understand the basis for this limit and to discuss a more reasonable cleanup goal as justified in our January 9, 2009 submission.

We look forward to hearing from you on scheduling a follow-up meeting for this project. In the meantime, if you have any questions or comments, please contact Robert Spooner at 860-982-0459.

Respectfully Submitted,

Marsal Martin

Marsal Martin
Site Manager
Montville Power LLC

Enclosures
Cc: Juan Perez, USEPA (e-copy only)
Robert Spooner, NRG (e-copy only)
Andrew D. Walker, LEP, CB&I (e-copy only)

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REMEDIAL ACTION PLAN
for
GROUNDWATER

MONTVILLE ELECTRIC GENERATING STATION
MONTVILLE, CONNECTICUT

February 25, 2016

Prepared for:

Montville Power LLC
Montville, CT

Written/Submitted by:

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CB&I Environmental & Infrastructure, Inc.

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Andrew D. Walker, LEP, LSP
Project Manager
CB&I Environmental & Infrastructure, Inc.

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
ASWPC	Alternative Surface Water Protection Criteria
bgs	below ground surface
CB&I	CB&I Environmental & Infrastructure, Inc.
CSM	Conceptual Site Model
CTDEEP	Connecticut Department of Energy & Environmental Protection
EB	EnviroBlend®
ELUR	Environmental Land Use Restriction
ERA	Ecological Risk Assessment
ETPH	extractable total petroleum hydrocarbons
ft	foot/feet
LEP	Licensed Environmental Professional
NA	Natural Attenuation
NDDB	Natural Diversity Database
NECR	New England Central Railroad
NRG	NRG Energy, Inc.
ORP	oxidation-reduction potential
PAHs	polynuclear aromatic hydrocarbons
PRB	Permeable Reactive Barrier
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RSRs	Remediation Standard Regulations
SWPC	Surface Water Protection Criteria
TB	TerraBond®Mg
ug/L	micrograms per Liter
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

On behalf of Montville Power LLC and its parent company NRG Energy, Inc. (NRG), CB&I Environmental & Infrastructure, Inc. (CB&I), has prepared this Remedial Action Plan (RAP) for shallow groundwater for Area of Concern 12 (AOC 12) at Montville Generating Station, located in Montville, Connecticut. A completed Connecticut Department of Energy and Environmental Protection (CTDEEP) Remedial Action Plan Transmittal Form is provided in **Appendix A**. A copy of the required public notice is provided in **Appendix B**. This RAP presents proposed activities to remediate site shallow groundwater in the overburden, impacted by metals (primarily arsenic), to the Alternative Surface Water Protection Criteria (ASWPC).

1.1 Remedial Action Plan Objectives

As a result of historic operations, the Montville Generating Station is being assessed and remediated as part of a State Corrective Action program under Licensed Environmental Professional (LEP) oversight and in communication with the CTDEEP Remediation Division. The overall objective of the corrective action proposed in this RAP will be to remediate the environmental condition of the Site to be protective of human health and the environment, and to allow for continued Site use as a power generation facility.

The specific objectives of this RAP are to:

- Present a summary of current conditions, including a synopsis of environmental groundwater data collected at the Site;
- Evaluate current environmental conditions relative to the Connecticut Remediation Standard Regulations (CT RSRs);
- Reduce concentrations of metals (particularly arsenic) in groundwater of AOC 12 to meet ASWPC standards;
- Review the applicability of various remedial technologies for groundwater and evaluate their effectiveness given the site-specific conditions; and
- Present the design plan for the selected remedial approach, including an implementation schedule.

2.0 SITE OVERVIEW

2.1 Site Location

Montville Generating Station is located on the west bank of the Thames River, approximately 7.5 miles upstream from Long Island Sound. The property is located between the Thames River and Lathrop Road, and is bisected from north to south by the New England Central Railroad (NECR).

A fence surrounds the entire property, which is approximately 49 acres in area. West of the NECR tracks and along the north and south property lines, the topography increases. Along the south property line west of the NECR tracks, the area is densely wooded. Residential properties abut the facility to the north and south for the portion of the property west of the NECR tracks.

2.2 Property Usage

The electric generating facility was constructed in 1919, and has been in continuous service. The facility utilized coal for combustion for approximately 52 years, and was then converted to oil combustion in approximately 1971.

As a result of historic operations, the Montville Electric Generating Station is being assessed and remediated as part of a State Corrective Action program under LEP oversight and in communication with the CTDEEP Remediation Division.

2.3 Project Background

Numerous site-wide investigations, risk assessments, remediation, and other activities have been conducted under the CT Transfer Act and Resource Conservation and Recovery Act (RCRA) Corrective Action programs. As summarized in the Phase III Investigation Final Report (Shaw, 2009), the assessment included the identification of 14 Areas of Concern (AOCs) inclusive of groundwater at the site. Design drawing Sheet C-1 (**Appendix D**) shows the general site information including AOCs, monitoring wells, facility structures, and natural resource areas.

Specific for groundwater at the site, additional correspondence with CTDEEP has included the July 2013 Preliminary Technical Impracticability submittal and subsequent August 2013 meeting with CTDEEP and USEPA. The August 2015 follow-up letter from CTDEEP summarizes communications regarding groundwater leading to preparation of this RAP. The following statements detailing significant milestones for groundwater decisions at the site are taken directly from the August 2015 CTDEEP follow-up letter:

1. "*This letter follows up on the Department's previous March 2013 Approval for Alternative Surface Water Protection Criteria (ASWPC) for arsenic of 10 micrograms per liter. The Department has reviewed NRG's September 10, 2013 email entitled "NRG Montville meeting follow up" prepared on your behalf by Andrew Walker of CBI Environmental. The email requested reconsideration of the prior approval and evaluation of six potential options for methodologies on calculating a different ASWPC for arsenic.*

   The Remediation Division in consultation with the Planning and Standards Division of the Department has reviewed the six options for methodologies and does not approve the requested methodologies. Therefore, the approved ASWPC for arsenic is 10 micrograms per liter, consistent with DEEP's previous March 2013 approval letter."

2. "*At this time NRG Montville needs to prepare an alternatives analysis of remedial strategies to bring the site into compliance with the Remediation Standard Regulations (RSRs), including the approved ASWPC for arsenic. Specifically, NRG should complete and submit a Remedial Action Plan (RPA) detailing at least five of the six final screening remedial technologies presented at the August 22, 2013 meeting[...]. It is the department's understanding that Monitored Natural*

Attenuation will not be able to achieve compliance with the RSR's, and therefore does not necessitate further review."

The August 2015 CTDEEP letter also required achievement of a RCRA Corrective Action "Construction Complete" milestone by September 30, 2018. In addition to the RAP schedule presented in Section 8, project schedules have been provided to CTDEEP and are updated in the semi-annual status reports to CTDEEP.

2.4 Topography and Surface Hydrology

Topography in the area of the site is generally sloping downhill from Lathrop Road to the Thames River. The developed areas of the site are flat with defined elevated and depressed manmade containment features and structures. The ground surface between Lathrop Road and the NECR is generally pervious with increasing areas of impervious surface in the developed areas closer to the river. Surface hydrology is limited to manmade features including a network of drains to manage stormwater across the site.

2.5 Geology and Hydrogeology

Geology and hydrogeology for the Site are described in the Phase III Investigation Final Report (Shaw, 2009) and more recent groundwater model evaluations. This section summarizes findings from previous reports.

Shallow groundwater exists in the overburden soils observed across the site, consisting of sand and gravel fill (with coal, coal ash and slag in some areas) over brown loose, coarse to fine sand and coarse to fine gravel with trace cobbles. The fill thickness west of the NECR right-of-way ranged from 6 inches to 7 feet below ground surface (ft bgs), while the fill thickness on the east side of the NECR right-of-way ranged from 0 to 15 ft bgs. At some locations east of the NECR tracks and adjacent to the Thames River, gray silty sand and sandy silt were observed beneath the fill at depths greater than 6 ft bgs.

The depth to groundwater varies throughout the site due to the variable ground surface elevation, such that the depth to groundwater is approximately 1 to 10 ft bgs along the bank of the Thames River (lower ground surface elevation) and approximately 20 to 43 ft bgs along the west boundary of the subject site (higher ground surface elevation). Groundwater contaminated with arsenic is the primary concern in the portion of the site west of the NECR tracks.

Groundwater at the site is classified as both GB and GA/GAA. The groundwater classification across the site is divided by the NECR right-of way that bisects the site. The area east of the railroad is classified as GB, while the area west of the railroad is classified as GA/GAA. GA and GAA classifications were established by CTDEEP to describe groundwater existing in a private and/or public water supply area. GB classification was established by CTDEEP to describe groundwater located in a heavily urbanized area of intense industrial activity, where a public water supply is available. Groundwater located within a GB area may not be suitable for human consumption due to historical releases and discharges without prior treatment.

The groundwater flow direction is easterly in the direction of the Thames River. The groundwater horizontal gradient west of the NECR tracks ranges from 0.002 to 0.014 foot per foot (ft/ft) and across the site east of the NECR tracks ranges from 0.001 to 0.008 ft/ft. Based on the groundwater model developed for the site, the groundwater gradient ranges from 0.007 to 0.009 ft/ft in the eastern portion of AOC 12.

According to published hydraulic conductivity values by C.W Fetter, hydraulic conductivity values for sand and gravel range from to 10^{-3} to 10^{-1} centimeters per second (cm/s) or 2.8 to 283.5 feet per day (ft/day) (Fetter, 1994). Based on the groundwater model developed for the site, the hydraulic conductivity value that is the best statistical fit for the eastern portion of AOC 12 is 16 ft/day.

2.6 Constituents of Concern

AOC 12, as shown on Drawing Sheet C-1, is the focus of this RAP because this is the area where metals concentrations in groundwater (primarily arsenic) significantly exceed the ASWPC.

AOC 12 occupies the northern half of the site east of the NECR tracks, and consists of a developed area of the station that was formerly used for coal storage and coal ash disposal.

AOC 12 is a former coal and coal ash handling area. The physical environment is industrial consisting of; fuel oil and chemical storage areas and tanks; a wastewater treatment facility; a former Equalization Basin; a concrete treatment pond; a garage and parking areas; above ground piping; and access roads constructed of gravel and asphalt.

Groundwater at the site has been monitored and reported on an annual basis since the early 1990s. The primary compound of concern in AOC 12 groundwater is arsenic, which is limited to the eastern portion of AOC 12 with concentrations significantly above the CT ASWPC. Summary statistics for the constituents of concern in the AOC 12 area, provided in **Table 1**, show that several metals were detected at concentrations greater than the ASWPC. However, only arsenic also has an average concentration greater than the ASWPC. An excerpt from **Table 1** is provided below.

Constituent	Frequency of Detection	Percent Detection	Average Concentration (ug/l)	ASWPC (ug/l)	Does Maximum Concentration Exceed ASWPC?	Does Average Concentration Exceed ASWPC?
Metals (Total)						
Arsenic	38/46	83%	120.39	10	Yes	Yes
Beryllium	28/46	61%	3.65	20	Yes	No
Copper	19/46	41%	78.75	310	Yes	No
Nickel	36/46	78%	141.5	880	Yes	No
Vanadium	30/46	65%	340.67	440	Yes	No
Zinc	32/46	70%	207.11	8100	No	No

ug/l – micrograms per liter

Since groundwater from AOC 12 discharges to the Thames River, data is compared to the ASWPC for compliance purposes. A review of the last 10 years of groundwater concentration data indicates that the groundwater concentrations are generally stable. A steady state condition appears to exist at the site. The increases in groundwater concentrations and the mass of metals leaching from soil/ash are balanced by the loss of metals mass and concentration reduction caused by the diffuse discharge of groundwater to surface water. This is in conjunction with Natural Attenuation (NA) processes, primarily dispersion of metals along the groundwater flow paths, and adsorption of metals to the saturated porous media.

2.6.1 Ecological Risk

There is no potential significant ecological risk associated with groundwater or due to secondary impacts to surface water and sediments.

The potential for risk to ecological receptors at the site from groundwater has been quantified using a variety of techniques. There is no risk to ecological receptors at the site from direct exposure to groundwater, since the depth to groundwater at the site is such that direct exposure of ecological receptors via groundwater is unlikely. Groundwater that discharges from the site to the adjacent Thames River has been assessed in the Phase III Investigation Final Report (Shaw, 2009) and evaluated as part of the Revised Ecological Risk Assessment (ERA) (Shaw, 2011), which was approved by EPA and CTDEEP in June 2011. The reports find that potential discharge of impacted groundwater to the Thames River would be unlikely to have a significant impact on aquatic life (Shaw, 2011).

Based upon arsenic concentrations in groundwater samples collected near the river that exceeded the ASWPC, two rounds of surface water samples were collected from the river and analyzed for arsenic. Surface water analytical results from September 2012 and May 2013 show that arsenic was either non-detect or detected at concentrations well below the Water Quality Criterion for aquatic life for arsenic of 36 ug/L, indicating that exposure to arsenic concentrations in the Thames River surface water near the site is unlikely to have an impact on aquatic life.

The potential for risk to ecological receptors from exposure to sediment in the Thames River and Bartlett Cove was assessed in the Revised ERA (Shaw, 2011). Using multiple lines of evidence, it was concluded that effects on ecological receptors from exposure to Thames River sediment and Bartlett Cove sediment are unlikely.

In a March 13, 2013 letter, CTDEEP approved Alternative or Additional SWPC for six metals, two polynuclear aromatic hydrocarbons (PAHs), and extractable total petroleum hydrocarbons (ETPH). The approved arsenic concentration is 10 ug/L. The remedial objective for groundwater is to meet the ASWPC of 10 ug/L for arsenic in groundwater discharging to Thames River surface water, or to prevent the discharge of groundwater to surface water, thus eliminating the need to meet the ASWPC. CTDEEP confirmed the ASWPC for arsenic in their August 25, 2015 follow-up letter.

2.6.2 Human Health Risk

The potential risk to human health has been evaluated following industry standard procedures. There is no significant current or future risk to human health from groundwater or surface water, because no current or future use of groundwater or surface water for drinking or irrigation purposes in the site area is known or expected. In addition, groundwater flows east towards the Thames River and not towards the residential properties abutting the site to the north and west. There also are no current site activities which would expose a worker to groundwater or surface water. Potential trespassers are controlled by perimeter fencing, posted signage, and a guard and gate system. Potential future risk to human health from groundwater at the site will be mitigated by an Environmental Land Use Restriction (ELUR).

2.7 Habitat

The Natural Diversity Database (NDDB) maps developed by CTDEEP delineate approximate locations of endangered, threatened, and special concern species. The site is located in a shaded area on the September 2015 map indicating a potential impact on endangered or threatened species or significant natural communities. Therefore, CB&I will submit a NDDB review request for the groundwater remediation project as part of the permitting process.

3.0 CONCEPTUAL SITE MODEL

The Phase III Investigation Final Report (Shaw, 2009) presented a fully developed Conceptual Site Model (CSM) for each AOC at the site and incorporated available data collected from the site during previous investigations and assessment activities.

The CSM identified the nature of the release, the nature of the contaminants, transport mechanisms, and migration pathways. As a result of remedial actions completed at the site, additional environmental sampling completed at the site, and CTDEEP approval of Alternative and Additional SWPC (CTDEEP, 2013), conclusions on groundwater compliance at a few AOCs were adjusted and presented in the TI (Shaw, 2013). The CSM is provided in **Figure 1**.

4.0 REMEDIAL ACTION GOALS

The goal of this remedial action is to reduce concentrations of metals (particularly arsenic) in groundwater of AOC 12 to meet ASWPC standards. Upon the completion of remedy implementation, groundwater should meet ASWPC at the final compliance points immediately prior to discharge to the river for four quarters over 2 years per RSRs 22a-133k-3(g)(1) and (2).

5.0 REMEDIAL TECHNOLOGY EVALUATION

This section supports the selection of a remedial action alternative for groundwater by providing information on the process by which the recommended remedial action alternative was developed and evaluated. This section includes an initial identification and screening of alternatives, a detailed evaluation of surviving alternatives, and a statement to justify the selected alternative. A comprehensive review of federal and state guidance documents, case studies, and project summaries both in-house and on-line was performed to identify, develop, and evaluate applicable alternatives for implementation on this project.

An initial screening of remedial technologies was conducted, resulting in the selection of six alternatives for more in-depth evaluation. The six remedial alternatives were then scored using seven criteria to determine the best alternative. Bench-scale treatability testing and groundwater modeling were conducted as part of the final scoring and selection process. These steps generally follow United States Environmental Protection Agency (USEPA) Directive No. 9234.2-25 and are discussed in more detail in the following sections.

5.1 Development of Alternatives

An initial screening of applicable remedial technologies for metals-impacted groundwater was conducted as a first step to assess remedial alternatives for AOC 12 groundwater. A remedial technology was deemed applicable if it is reasonably likely to achieve source control and overall protection of human health and the environment, attain or approach media cleanup standards, and comply with waste management standards. Forty remedial technologies were included in the initial screening under the following major categories:

- In Situ Biological Treatment
- In Situ Physical Chemical Treatment
- Ex Situ Biological Treatments
- Ex Situ Physical/Chemical Treatment (assuming excavation of soil and ash source)
- Ex Situ Physical/Chemical Treatment (assuming pumping of groundwater and treatment)
- Containment

The remedial technologies were scored based on three criteria: effectiveness, implementability, and cost. The remedial technologies with the top six scores that were selected for final detailed scoring include:

- Natural Attenuation (NA)
- Chemical Fixation Using EnviroBlend® (EB) Subsurface Aquifer Injections
- Chemical Fixation Using TerraBond® (TB) Permeable Reactive Barrier (PRB) Upgradient and EnviroBlend® PRB Downgradient
- Groundwater Pumping and Treatment
- Interceptor Trench for Hydraulic Containment and Groundwater Treatment
- Barrier Wall with Minimal Pumping and Treatment

5.2 Discussion of Remedial Options

The remedial alternatives selected for final detailed scoring were evaluated and scored using an evaluation scoring matrix (**Table 2**). **Table 2** incorporates the following seven evaluation criteria: effectiveness, reliability (permanence), difficulty (implementability), cost, risk of implementation, timeliness, and green benefits. Using this matrix, the remedial alternatives were evaluated, and a score was assigned to rate each one. A scoring system (1 to 5 points) was applied to each criterion to arrive at a total score for each alternative for rating purposes. The scores for each criterion are weighted based on importance; for example, effectiveness, cost, and green benefits each has a maximum score of 5, whereas the other criteria have maximum scores of 3.

As shown on **Table 2**, the highest overall score of 22 points was determined for the chemical fixation PRBs alternative followed by the natural attenuation alternative with 21 points, the other chemical fixation alternative with 18 points, the groundwater pumping and treatment and interceptor trench alternatives with 11 points each, and the barrier wall alternative with 10 points. Of the seven criteria, NA had the highest (best) score for reliability, difficulty, cost, risk of implementation, and green benefits. However, NA had the lowest (worst) score for effectiveness and timeliness as it fails to accomplish remediation goals within 20 years. The chemical fixation PRBs alternative had a higher score than NA for effectiveness (highest ranking of the six alternatives) and timeliness as it will achieve remediation objectives within 20 years. Therefore, Chemical Fixation Using TerraBond® PRB Upgradient and EnviroBlend® PRB Downgradient was the highest overall ranked alternative.

As discussed in Section 2.3, preliminary remedial options were previously discussed with CTDEEP Remediation Division during a meeting in August 2013. As stated in the August 25, 2015 follow-up letter from CTDEEP Remediation Division, "It is the Department's understanding that Monitored Natural Attenuation will not be able to achieve compliance with the RSR's, and therefore does not necessitate further review." NA was included in **Table 2** as a baseline for comparison of the other alternatives. Even though NA scored well, it failed to achieve the timeliness requirement and could not be considered further.

5.2.1 Treatability Study

In conjunction with evaluating the remedial alternatives in the scoring matrix, a bench-scale treatability study was conducted to test treatments of soil and groundwater slurries to determine if chemical treatment can reduce metals concentrations in site groundwater to concentrations below ASWPC. CB&I's Knoxville Laboratory, one of the world's leading remediation labs and a long-time USEPA client for recalcitrant sites, was used in a collaborative manner to evaluate potential remedial options. Mr. Ernie Stein, PhD, led the CB&I team during this task. A summary of the project steps and the results of the treatability study are provided below.

- Soils and associated groundwater that had the highest arsenic content were collected from AOC 12 in November 2012; soil from borings AOC 12-306- 5-15' and AOC 12-307- 5-15', and groundwater from monitoring wells NRG-MW-06 and AOC12-MW-306. Samples collected for the treatability study were submitted to CB&I's Knoxville Laboratory.

- The 24-hour non-equilibrium adsorption coefficient, K_d value, was measured for the seven metals of concern (arsenic, beryllium, copper, nickel, zinc, lead and vanadium) for use in groundwater flow modeling.

- Tier I proof-of-principle testing was conducted to evaluate the effectiveness of commercially available metals sorption agents and chemical fixation reagents to limit the solubility and leachablity of the metals of concern during in-situ treatment. Reagents investigated included the following:

  - TerraBond®Mg (TB)
  - triple superphosphate (TSP)
  - EnviroBlend® (EB),
  - FerroBlack-Hybrid (FB-H),
  - FerroBlack-Hybrid-Fe (FB-H-Fe) and
  - Solutions of ferric chloride ($FeCl_3$).

- In the proof-of-principle Tier II study, two reagents from Tier I were tested on the soil/groundwater slurries. Reagents investigated included:

  - 3.25 percent TB, and
  - 3.25 percent TB followed by 4 percent EB.

- The approximate lifetime of a TB reactive wall was estimated using the acidity of the groundwater from the western edge of the contaminate's zone, the alkalinity of the TB reagent, and the expected groundwater flow rates.

The results of the treatability study showed that the reagent blend of 3.25 percent TB followed by 4 percent EB is the most favorable chemical fixation reagent to limit the solubility/ leachability of the metals of concern, and would likely reduce concentrations to the ASWPC. Based on the method used in the treatability study, the two reagents would be applied sequentially as opposed to in combination. Note EB is significantly more expensive than TB on a per ton basis.

5.2.2 Groundwater Modeling

In conjunction with evaluating the remedial alternatives in the scoring matrix, CB&I developed a detailed groundwater model to predict the performance of the six remedial alternatives. Mr. Vikas Tandon, PhD, Senior Hydrogeologist/modeler for CB&I, led the CB&I team during this task.

CB&I developed a three-dimensional groundwater flow and transport model to establish the effectiveness of the various remedial alternatives on the spatial extent and the persistence of metals dissolved in groundwater. The model predictions were used as decision-making tools in the process of determining whether it is practical or impractical to remediate the groundwater, within a reasonable time frame and cost, utilizing the currently available remedial technologies. A description of the model is provided in **Appendix C** with figures depicting the output for each alternative.

5.3 Retained Remedial Option

Chemical Fixation Using TB PRB Upgradient and EB PRB Downgradient has been selected as the remedial alternative due to its effectiveness in the given timeframe. Advantages and disadvantages to the various components of this and the other remedial alternatives are detailed in **Table 2**.

This alternative consists of the application of two reagents, TB and EB, via injection into groundwater along two separate parallel lines of injection wells constituting the PRBs in a timed sequence. Injection of TB in the first PRB located upgradient of the highest arsenic concentrations in groundwater will be followed by injection of EB in the second PRB located downgradient of the highest arsenic concentrations and at the edge of the Thames River. TB will raise the groundwater pH to fixate arsenic and other metals of concern to low levels and EB will fixate the low level metals remaining in the groundwater plume to meet ASWPC. The EB injection will be timed to occur as the groundwater treated with TB approaches the EB PRB. Based on the groundwater model, groundwater is anticipated to reach the EB PRB from the TB PRB in approximately 5 years. The injections will be performed as one-time events with no systems or other equipment to operate or maintain during the remediation period. Thus, costs for the selected remedial alternative are generally limited to installation and use of injection and monitoring wells, mixing and injection equipment, the required reagent, and accessory materials and equipment. Groundwater monitoring is the only activity conducted outside the injections during the remediation period.

6.0 PROPOSED REMEDIAL APPROACH AND ACTIVITIES

The Montville Electric Generating Station property will be utilized for implementation of the RAP. This section describes the process steps which are detailed in the design drawings provided in **Appendix D**. The operations identified in this RAP will be performed by a qualified contractor under the direct oversight of Montville Power LLC. The LEP will have direct involvement with the day to day implementation of this RAP. The design drawings were prepared for the contractor's use with performance requirements identified in place of specific details in some instances.

6.1 Remedial Approach

In general, the remedial approach will inject chemical fixation reagents to form a permeable reactive barrier positioned across the groundwater plume perpendicular to the groundwater flow direction to adjust the pH and fixate the constituents of concern in the groundwater before the groundwater discharges to the river. The remedial approach consists of the following general tasks:

- Monitoring Well Installation,
- Injection Well Installation,
- Chemical Fixation Reagent Handling and Storage Set Up,
- Mixing Equipment and Injection Manifold Set Up,
- Reagent Slurry Injections, and
- Equipment Decontamination and Demobilization.

The various activities required to execute the remedial tasks will be conducted in phases throughout the remediation period in an effort to increase efficiency in the delivery of reagent to the subsurface. The project will begin with a pilot test, followed by an injection of TB, and then an injection of EB. The processes will be adjusted after each phase as needed. The anticipated phases in the remediation period are as follows:

- Pilot Test
- Year 1 – TB Injection
- Year 5 – EB Injection

6.2 Remedial Tasks

This section describes the planned remedial tasks. Specifics for implementation of these tasks for each phase of the remediation are identified in later sections.

6.2.1 Monitoring Well Installation

Additional groundwater monitoring wells will be installed to supplement the existing network of wells around the PRBs. Proposed locations within the treatment zone consisting of the area between the PRBs and downgradient of the EB PRB are identified in the design drawings. The wells downgradient of the EB

PRB at the river's edge will represent the compliance point where groundwater remediation objectives (i.e., concentrations of constituents of concern in groundwater meet ASWPC) must be achieved. Utility location and clearance for intrusive activities will follow the procedures identified in the site Health and Safety Plan.

The monitoring wells will be installed comparable to existing wells to a maximum depth of 30 feet below grade. The monitoring wells will be constructed with 2-inch Schedule 40, threaded, flush-jointed, polyvinyl chloride (PVC) riser pipe. The wells will be constructed with a 15-foot long 0.01-inch (10 slot) factory slotted well screen and will be screened across the water table and the vertical treatment zone. Soil samples will be collected by a macro-core sampler at each location and submitted to the laboratory for analysis of constituents of concern. With the well screen in place, a clean silica sand filter pack will be installed in the annular space from the bottom of the borehole to a depth one foot above the top of the well screen. A bentonite seal (approximately 1 foot thick) will be placed above the filter pack followed by a cement/bentonite slurry to the ground surface. The monitoring well will be completed with a concrete pad and appropriate road box. The monitoring well will be developed one day or more after installation.

6.2.2 Injection Well Installation

A total of 50 injection wells will be installed in up to three phases (i.e., pilot test, TB injection, and EB injection) during the remedy implementation. The injection wells will be installed in two roughly parallel rows of wells (each row constitutes a PRB) with approximately 15 feet between wells in each row. One row of 25 wells measuring approximately 435 feet in length (divided by berm and aboveground piping) will be for TB injection (upgradient) and the other row of 25 wells measuring approximately 360 feet in length will be for EB injection (downgradient). The location of the injection wells and access to perform the installation will require maneuvering around existing storage tanks and above ground piping as well as the existing earthen berm. The locations shown on the design drawings are subject to be shifted as needed based on field conditions. Utility location and clearance for intrusive activities will follow the procedures identified in the site Health and Safety Plan.

The injection wells will be installed up to 30 feet below ground surface with 2-inch PVC screen and riser and finished with an appropriate road box. The injection wells will be constructed with 10 foot length screens alternating between the top of the water table and 5 feet below the top of the water table. Thus, the injection zone will span a total of 15 feet below the water table. The top of each well will be fitted with or fitted to accommodate low pressure injection fittings. These wells are intended to be used for multiple injections during the remediation period and are planned to be constructed as permanent wells. However, the well construction during the future phases of installation may be modified depending on the performance of the wells installed during the initial phases. Modifications may include changes in well depth, length of well screen, or use of temporary direct push injection wells.

6.2.3 Chemical Fixation Reagent Handling and Storage Set Up

Two chemical fixation reagents will be used for groundwater remediation – TB and EB. TB is manufactured by Terra Materials, LLC in Indiana (www.terramaterials.com) and is a proprietary magnesium blend that targets lead, arsenic, and cadmium. TB is a magnesium-based alkaline reagent. EB is manufactured by Premier Magnesia, LLC in Pennsylvania (www.enviroblend.com) and is a custom tailored blend for the constituents of concern. The selected EB reagent powder will be a 90/10 blend meaning a formulation of 90 percent magnesium oxide and 10 percent TSP. Both products are powders and can be delivered to the site in sacks or in bulk truck. Reagents will be stored under cover on site in a designated area until needed for mixing.

6.2.4 Mixing Equipment and Injection Manifold Set Up

The reagents will be mixed with water to form a suspension suitable for injection. A water source and electrical connection are available on site. Based on the treatability study, 4% EB and 3.5% TB will be used for the initial injections of each reagent. Mixing will be performed in a rented or temporary tank equipped with a mixer and transfer pump. Powdered reagent will be transported from the storage area to the mixing area as needed. Water will be obtained from the facility and transported to the mixing area via water truck or hoses. Both reagents only minimally dissolve in water and will be suspended in an approximately 10 to 20 percent (by volume) slurry with water for injection. Slurry will be pumped into the distribution manifold.

A distribution and injection manifold will be assembled for each set of wells including injection flex piping, header piping, valves, and flow meters. The injections will likely be performed at groups of wells (i.e., 3-4 wells) and not all TB or EB wells at the same time in order to better control the quantity of slurry delivered to each injection well.

6.2.5 Reagent Slurry Injections

Once the site setup is complete, a batch of reagent slurry will be prepared and the injection will begin. Personnel will monitor the flow meters and adjust valves at each injection well as needed in an effort to more evenly distribute the slurry to the PRB. Injection system pressures will be maintained at less than 100 pounds per square inch (psi). The injections will be performed in batches. When the injection is complete, modular components of the injection system will be removed.

During injections, possible reagent surfacing (known as daylighting) may occur at the ground surface or along drainage features and will be monitored. Injection pressures will also be monitored as sudden reductions may be an indication of amendment loss into subsurface, possibly from a high-permeability zone. If daylighting on the surface or in nearby drainage features is detected, injection rates will be reduced, the injection well will be sealed, or injections will be shut down.

6.2.6 Equipment Decontamination and Demobilization

Equipment and tools used for well installation or injection activities will be decontaminated in the decontamination pad prior to leaving the site at a minimum.

Demobilization of temporary components of the injection system will be removed at the end of each phase of injection. Upon completion of the injections and achievement of remedial goals, the injection wells will be abandoned by grouting and removing the surficial structure. The surface will be backfilled and surfaced to match surrounding gravel and asphalt pavement.

6.3 Pilot Test

A pilot test is recommended to be performed prior to implementing the full scale injection due to the complexity of the remedial approach. This section describes the proposed pilot test scope and evaluation of results.

6.3.1 Pilot Test Scope

The scope of the pilot test will consist of 2 to 4 days each of TB and EB injection at select injection wells. An estimated 2,100 gallons of TB slurry and 2,800 gallons of EB slurry are anticipated to be injected in each well. An environmentally safe color tracer dye may be added to the slurry to aid in evaluation of the pilot test. The pilot test will include injections at 3 adjacent TB injection wells and 3 adjacent EB injection wells. The layout for the pilot test is indicated on the design drawings. The injections will be performed during warmer weather such that heaters and winterization equipment will not be required.

Groundwater samples will be collected from the single monitoring wells located immediately downgradient of each set of test injection wells before and after the test injection. One groundwater sample will be collected prior to the test injection and 3 groundwater samples will be collected after the test injection. Starting 4 weeks after injection, one groundwater sample will be collected at 4 week intervals over 12 weeks (i.e., sample at 4, 8 and 12 weeks after injection). Groundwater samples will be analyzed by the contract laboratory for target constituents and select geochemistry parameters.

In order to aid in determining the radius of influence of the reagents, soil borings will be performed beginning 24 hours after the injection. In each of the TB and EB injection well rows used for the pilot test, the first soil boring will be half the distance in between two of the injection wells. The soil boring will continue to 5 feet below the bottom of the deepest injection well screen of the adjacent injection wells. Soil borings will be conducted with a Geoprobe rig outfitted with a macrocore sampler or equivalent to retrieve soil cores to view at the surface. If reagent is not visible in the first boring, or at the discretion of the project manager, a second boring will be conducted at half the distance between the first boring and the center injection well. Additional borings may be conducted at the discretion of the project manager. Soil cores will be visually inspected and no samples will be collected for laboratory analysis.

6.3.2 Pilot Test Evaluation

The pilot test will be the first use of chemical fixation reagents at the site for groundwater treatment. Because the treatability study already identified the necessary reagent types and formulas, the purpose of the pilot test is to evaluate component functionality, operational parameters, and reagent effectiveness. Component functionality and operational parameters can be evaluated in real time during the field step of the pilot test whereas reagent effectiveness will be evaluated primarily after the laboratory analysis step of the pilot test.

Component functionality includes assessing the equipment required for the injections along the entire injection train from the slurry mixer to the construction of the injection wells. Operational parameters, such as slurry handling and injection rates, will be monitored during the pilot test. Visual observations made during the pilot test will allow personnel to make minor adjustments or improvements in the field.

Reagent effectiveness will be evaluated through soil borings activities and analysis of groundwater samples. Soil borings will be performed around the injection wells to look for visual evidence of the presence of reagent. This visual test will indicate the radius of influence of the injection. Groundwater samples will be collected from monitoring wells and analyzed to determine the percent reduction in concentration over time and space of the constituents of concern.

The results of the pilot test, both field and laboratory analysis steps, will be used to adjust the future equipment specifications and injection procedures. The following performance goals will be the primary means of demonstrating the suitability of the pilot test parameters for the planned full-scale remedial approach:

1. Injection rate – achieving an injection rate of 1 gallon per minute (gpm) or greater at an injection system pressure of less than 100 psi;
2. Radius of influence – documented visual evidence of injected reagent at a horizontal distance of at least half way between injection wells and a moderately even vertical distribution consistent with the injection well screen interval;
3. Percent reduction in concentration of the constituents of concern – significant reductions (i.e., ~>50%) in groundwater concentrations of target constituents not attributable to historically observed seasonal variation or analytical issues; and
4. Timeliness – rate of change in concentrations of target constituents in groundwater over time to verify the timing sequence of the groundwater model.

6.4 TB Injection

After the pilot test is complete, the TB injection will be performed and the remediation period will begin at Year 1. The TB injection program was designed based on a desired dosage rate of 1.6 kilograms of TB per cubic foot of aquifer to be treated. Thus, an estimated 16 tons of TB will be purchased for the injection. Using a 9:1 ratio of water to TB by volume and an estimated 840 gallons of slurry injected each day in each well, the application will inject approximately 52,800 gallons of slurry into the aquifer over 21 days. The slurry ratio, injection rate, and other operational parameters are subject to change based on the results of the pilot test. The injections will be performed during warmer weather such that heaters and winterization equipment will not be required.

6.5 EB Injection

The EB injection will be performed at Year 5 in the remediation period. The EB injection program was designed based on a desired dosage rate of 2.1 kilograms of EB per cubic foot of aquifer to be treated. An estimated 34 tons of EB will be purchased for the injection. Using a 9:1 ratio of water to EB by volume and an estimated 840 gallons of slurry injected each day in each well, the initial application will inject approximately 71,300 gallons of slurry into the aquifer over 29 days. The slurry ratio, injection rate, and other operational parameters are subject to change based on the results of the pilot test and lessons learned from the TB injection. The injections will be performed during warmer weather such that heaters and winterization equipment will not be required.

The selected blend of EB includes 10 percent TSP, so that the 90 percent magnesium oxide in the EB blend does not raise groundwater pH to a level where arsenic removal from groundwater and adsorption to the aquifer material is adversely affected. The phosphate released from TSP injection is expected to bind with the calcium in the groundwater and form apatite mineral, which will act as a substrate that arsenic can adsorb to and, therefore, be removed from dissolved phase in groundwater. As a result, the released phosphate is not likely to discharge as bioavailable phosphorous in significant quantity to the surface water (i.e., Thames River). In addition, due to the fact that the discharge is to the Thames River, a flowing water body, the probability of adverse ecological effects (such as eutrophication) are expected to be minimal.

6.6 Maintenance TB and EB Injections

Though chemical fixation is a rapid and enduring treatment, small maintenance injections may be required over the remediation period. The determination will be made based on the results of regular groundwater monitoring.

7.0 ADMINISTRATIVE AND MONITORING ACTIVITIES

7.1 Public Notice Requirements

The RSRs require a 45-day public comment period. A copy of the required public notice is provided in **Appendix B**.

7.2 Permitting

Performance of the groundwater remediation activities will require state and local authorizations and permits as detailed in this section. Formal applications for the state required permits will be submitted and preliminary discussions with the local authorities will be initiated after the draft RAP is submitted to CTDEEP.

7.2.1 Federal

As the project does not involve work in or over resource areas (i.e., Thames River and associated wetlands), no federal permits or authorizations are required to execute this RAP.

7.2.2 State

The underground injections will be authorized by CTDEEP Remediation Division with two Temporary Authorizations using the *Application for Emergency or Temporary Authorization to Discharge to Groundwater to Remediate Pollution*. A Temporary Authorization is applicable for short-term duration projects allowing a total of up to 90 days of injection over a period of 1 to 2 years. Any larger or longer injection projects would require an Individual Permit. For execution of this RAP, two Temporary Authorizations will be issued: one for the Pilot Test and TB injection in Year 1 and one for the EB injection in Year 5. The authorization for the pilot test and TB injection will be requested in combination because, with the Temporary Authorization, CTDEEP does not allow injection of the same material (i.e., TB) for 1 year after completion of the authorized injection. Given the lag time between EB injection in the Pilot Test and EB Injection in Year 5, the second Temporary Authorization will cover the EB Injection in Year 5 by itself.

7.2.3 Local

As with previous environmental activities conducted at the site where state permits are obtained, the Town of Montville will be notified of the planned work and copied on any state permit submittals. No additional local permits or authorizations are anticipated to be needed to execute this RAP.

7.3 Operations and Maintenance

Operations and maintenance requirements are limited to the short-duration injection events themselves. Outside of the injection events, there is no equipment or systems to manage during the remediation period. Equipment used for the injections will be modular and temporary and disassembled between injection events. Reusable or leftover materials purchased for the injection events, including unused reagent powder, will be stored in a covered area of the facility. Injection and monitoring wells will be maintained in working condition and protected from damage during regular facility operations.

7.4 Long-Term Groundwater and Surface Water Monitoring

A detailed groundwater monitoring plan is required to demonstrate compliance and remediation progress throughout the program.

Groundwater monitoring will be conducted at the existing and newly installed treatment zone wells pre- and post-injections. The pre-injection sampling will be performed one time and will serve as a baseline of groundwater conditions. The post-injection sampling will be performed on a semi-annual basis (i.e., spring and fall) beginning in Year 1 after the TB injection event. Generally all monitoring wells in the groundwater remediation area will be sampled as needed each event. It is anticipated that sampling will continue a few years after the Year 5 EB injection. Water quality parameters including temperature, dissolved oxygen, pH, oxidation-reduction potential (ORP), and conductivity will be field measured during groundwater sample collection. The groundwater samples will be submitted to the contract laboratory for analysis of constituents of concern (i.e., select metals) and geochemistry parameters. The groundwater samples collected from the 3 wells located between the EB injection wells and the river will also be analyzed for phosphate.

Analytical results will be reported to CTDEEP Remediation Division after each sampling event. Each data transmittal will include an assessment of the groundwater monitoring plan and identify any changes for future sampling events.

Groundwater from the site discharges to the Thames River. The need for surface water sampling will be determined based on the results of the groundwater monitoring program. If concentrations of COCs in groundwater samples exceed the remediation goals, then the need for surface water sampling will be evaluated. Based on historic surface water sampling data, it is expected that any future surface water sampling will continue to illustrate that impacts of metals from groundwater discharge are negligible. In addition, as described in Section 6.5, phosphate or phosphorous from the EB injection in groundwater discharging to surface water is not anticipated to be present in any significant quantity. No surface water sampling is planned for the project at this time.

7.5 Reporting

Reporting under this RAP will include semi-annual monitoring reports and the RAP Completion Report. The semi-annual monitoring reports will present the results and findings from any groundwater, surface water, or soil sampling conducted within the 6-month reporting period. Reports will be submitted to CTDEEP Remediation Division, USEPA, and to other various agencies as needed (e.g., permitting).

8.0 SCHEDULE

Although dependent upon obtaining required authorizations/permits and selection of a contractor through a competitive bidding process, the proposed remediation schedule is as follows:

- April 2016, permit applications submitted to various agencies.
- June 2016, RAP public notice will be issued (Copies of the Public Notifications including a legal notice and notice to the Montville Health Department are included in **Appendix B**).
- July 2016, 45-day RAP public comment period ends.
- September 2016, required permits received by Montville Power LLC.
- October 2016, contractor mobilization, pilot test performed.
- April 2017, pilot test final results.
- October 2017, contractor mobilization, remedial activities initiated (Year 1).
- January 2018, TB injection final results.
- August 2021, contractor mobilization, remedial activities continued (Year 5).
- November 2021, EB injection final results.

9.0 REFERENCES

Connecticut Department of Energy & Environmental Protection (CTDEEP), 2013. Approval RE: Request for Criteria for Additional Polluting Substances and Alternative Criteria, Montville Station, 74 Lathrop Road, Montville, CT, REM ID 7469. March 13, 2013.

CTDEEP, 2015. Disapproval RE: Request for Alternative Surface Water Protection Criteria, Montville Station (NRG) 74 Lathrop Road, Montville, CT, REM ID 4204 EPA ID. No. CTD049181654. August 25, 2015.

Shaw Environmental, Inc. (Shaw), 2009. Phase III Investigation Final Report, Montville Generating Station, Montville, Connecticut. January 26, 2009.

Shaw, 2011. Revised Ecological Risk Assessment, Montville Power LLC, Montville, Connecticut. January 24, 2011.

Shaw, 2013. Engineering Control Submittal Part 2, Montville Generating Station, Montville & Waterford, Connecticut. February 26, 2013.

Shaw, 2013. Preliminary Technical Impracticability Assessment for Groundwater, Montville Generating Station, Montville Power LLC, Montville, Connecticut. July 16, 2013.

10.0 LIMITATIONS ON WORK PRODUCT

The information contained in this report, including its conclusions, is based upon the information that was made available to CB&I during the investigation and obtained from the services described, which were performed within time and budgetary restraints.

This report contains information and opinions that are limited to the date the report was issued. CB&I has not conducted any site visit, data review, or other investigation of a property since the date of the report relating to that property, and CB&I makes no representation with respect to, nor expresses any opinion about, any property after the date of the report. By providing this report, CB&I does not assume any obligation to update the report for any purpose whatsoever.

CB&I makes no representation concerning the legal significance of its findings or of the value of the property investigated. CB&I has no contractual liability to any third parties for the information or opinions contained in this report.

Unless and until the parties agree otherwise in writing, the use of this report or any information contained therein by any third party shall be at such third party's sole risk. Such use shall constitute an agreement to release, defend and indemnify Montville Power LLC or NRG Energy, Inc. and CB&I from and against any and all liability in connection therewith.

TABLES

Table 1
AOC 12 Groundwater COC Summary Statistics
Compared to ASWPC
Montville Power LLC
Montville, Connecticut

Constituent (ug/l)	Freq. of Detect.	% Detect.	Max Conc.	Maximum Site	Max Date	Min Conc.	Minimum Site	Min Date	Average	ASWPC	Does Max Exceed ASWPC?	Does Avg. Exceed ASWPC?
CT ETPH												
ETPH	2/2	100%	89.9	AOC12-MW-306	6/12/2014	71.5	AOC12-MW-305	6/11/2014	80.7	500	No	No
Metals (Total)												
Arsenic	38/46	83%	2160	AOC3-SB1-MW-1	9/26/2011	1.8	AOC12-MW-301	12/3/2015	120.39	10	Yes	Yes
Beryllium	28/46	61%	36.8	AOC3-SB1-MW-1	6/16/2011	0.3	AOC12-MW-301	3/10/2014	3.65	20	Yes	No
Copper	19/46	41%	1240	AOC3-SB1-MW-1	5/28/2015	3	AOC3-SB1-MW-1	9/27/2012	78.75	310	Yes	No
Nickel	36/46	78%	1980	AOC3-SB1-MW-1	6/16/2011	2	AOC12-MW-305	5/27/2015	141.5	880	Yes	No
Vanadium	30/46	65%	2600	NRG-MW-06	9/26/2011	0.9	AOC12-MW-305	12/5/2014	340.67	440	Yes	No
Zinc	32/46	70%	2620	AOC3-SB1-MW-1	6/16/2011	20.4	AOC12-MW-301	11/26/2012	207.11	8100	No	No

ASWPC denotes SWPC, Alternative SWPC, or Additional SWPC.
Data set includes data from June 2011 to December 2015.
Data set includes wells AOC3-SB1/MW1, AOC12-MW301, AOC12-MW302, AOC12-MW303, AOC12-MW304, AOC12-MW305, AOC12-MW306, and NRG-MW-6.
Average formula uses one-half the reporting limit for non-detect results.
ug/l - micrograms per liter.

Table 2

Evaluation of Remedial Alternatives for Groundwater at AOC 12
Montville Generating Station
Montville, CT

Evaluation Criteria	Alternative 1 Natural Attenuation (NA)	Alternative 2 Chemical Fixation Using EnviroBlend® Subsurface Aquifer Injections	Alternative 3 Chemical Fixation Using TerraBond® PRB Upgradient & EnviroBlend® PRB Downgradient	Alternative 4 Groundwater Pumping and Treatment	Alternative 5 Interceptor Trench for Hydraulic Containment and Groundwater Treatment	Alternative 6 Barrier Wall with Minimum Pumping and Treatment
A. Effectiveness (Score 1-5)						
1) Ability to reduce human health and ecological risk to acceptable levels	• This alternative will not achieve compliance with alternative SWPC. • There is no significant risk to Human Health (currently and in the future). The approved Ecological Risk Assessment has shown that significant impact on ecological receptors associated with groundwater or due to secondary impacts to surface water and river sediments is unlikely. • ELUR will be placed on the property deed to permanently eliminate any human use of groundwater.	• This alternative will likely achieve compliance with alternative SWPC. • There is no significant risk to Human Health (currently and in the future). The approved Ecological Risk Assessment has shown that significant impact on ecological receptors associated with groundwater or due to secondary impacts to surface water and river sediments is unlikely.	• This alternative will likely achieve compliance with alternative SWPC. • There is no significant risk to Human Health (currently and in the future). The approved Ecological Risk Assessment has shown that significant impact on ecological receptors associated with groundwater or due to secondary impacts to surface water and river sediments is unlikely.	• This alternative will likely achieve compliance with alternative SWPC. Once system is optimized, this alternative contains and prevents additional discharge of impacted groundwater to surface water and river sediments. • There is no significant risk to Human Health (currently and in the future). The approved Ecological Risk Assessment has shown that significant impact on ecological receptors associated with groundwater or due to secondary impacts to surface water and river sediments is unlikely.	• This alternative will likely achieve compliance with alternative SWPC. This alternative immediately contains and prevents additional discharge of impacted groundwater to surface water and river sediments. • There is no significant risk to Human Health (currently and in the future). The approved Ecological Risk Assessment has shown that significant impact on ecological receptors associated with groundwater or due to secondary impacts to surface water and river sediments is unlikely.	• This alternative will likely achieve compliance with alternative SWPC. This alternative immediately contains and prevents additional discharge of impacted groundwater to surface water and river sediments. • There is no significant risk to Human Health (currently and in the future). The approved Ecological Risk Assessment has shown that significant impact on ecological receptors associated with groundwater or due to secondary impacts to surface water and river sediments is unlikely.
2) Ability to remove, destroy, treat, or detoxify hazardous material - Groundwater models were prepared for all six remedial alternatives to evaluate the effectiveness of the given remedial alternative.	• The results of the groundwater model indicate that this alternative has very limited ability to remove, treat or detoxify the hazardous materials over a long time frame.	• The results of the groundwater model and bench scale treatability study indicate that this alternative has the ability to remove, treat or detoxify the hazardous materials by chemical fixation.	• The results of the groundwater model and bench scale treatability study indicate that this alternative has the ability to remove, treat or detoxify the hazardous materials by chemical fixation.	• The results of the groundwater model indicate that this alternative has the ability to remove, treat or detoxify the hazardous materials (more so than Alternatives 5 or 6). • In addition, once system is optimized, this alternative prevents additional discharge of impacted groundwater to surface water and river sediments.	• The results of the groundwater model indicate that this alternative has the ability to remove, treat or detoxify the hazardous materials. • In addition, this alternative immediately prevents additional discharge of impacted groundwater to surface water and river sediments.	• The results of the groundwater model indicate that this alternative has the ability to remove, treat or detoxify the hazardous materials. • In addition, this alternative immediately prevents additional discharge of impacted groundwater to surface water and river sediments.
3) Type and quantity of treatment residual	• Impacted groundwater remains onsite; this alternative leaves most of the hazardous material potentially accessible to ecological receptors.	• Impacted groundwater remains onsite and is treated on site; this alternative fixates most of the hazardous material that would be accessible to ecological receptors once treatment is completed in ~2 years per the groundwater model.	• Impacted groundwater remains onsite and is treated on site; this alternative fixates most of the hazardous material that would be accessible to ecological receptors once initial treatment is completed in ~5 years per the groundwater model.	• Impacted groundwater is contained onsite. Containment likely eliminates discharge to surface water and river sediments and exposure to ecological receptors. • However, reducing arsenic concentrations onsite to <10 ug/l would take > 20 years.	• Impacted groundwater is contained onsite. Containment likely eliminates discharge to surface water and river sediments and exposure to ecological receptors. • However, reducing arsenic concentrations onsite to <10 ug/l would take > 20 years.	• Impacted groundwater is contained onsite. Containment likely eliminates discharge to surface water and river sediments and exposure to ecological receptors. • However, reducing arsenic concentrations onsite to <10 ug/l would take > 20 years.
Effectiveness Rating	**1**	**4**	**4**	**3**	**2**	**2**

Table 2

Evaluation of Remedial Alternatives for Groundwater at AOC 12
Montville Generating Station
Montville, CT

Evaluation Criteria	Alternative 1 Natural Attenuation (NA)	Alternative 2 Chemical Fixation Using EnviroBlend® Subsurface Aquifer Injections	Alternative 3 Chemical Fixation Using TerraBond® PRB Upgradient & EnviroBlend® PRB Downgradient	Alternative 4 Groundwater Pumping and Treatment	Alternative 5 Interceptor Trench for Hydraulic Containment and Groundwater Treatment	Alternative 6 Barrier Wall with Minimum Pumping and Treatment
B. Reliability (Permanence) (Score 1-3)						
1) Likelihood that technology will meet process efficiencies or performance specifications	• Moderate likelihood of meeting process efficiencies or performance specifications for NA.	• Moderate to high likelihood of meeting process efficiencies or performance specifications.	• Moderate to high likelihood of meeting process efficiencies or performance specifications.	• Moderate to high likelihood of meeting process efficiencies or performance specifications.	• Moderate to high likelihood of meeting process efficiencies or performance specifications.	• Moderate to high likelihood of meeting process efficiencies or performance specifications.
2) Relative risk associated with residual hazardous materials at 20 years	• No human health or ecological risk associated with residual COCs in groundwater.	• No human health or ecological risk associated with residual COCs in groundwater.	• No human health or ecological risk associated with residual COCs in groundwater.	• No human health or ecological risk associated with residual COCs in groundwater.	• No human health or ecological risk associated with residual COCs in groundwater.	• No human health or ecological risk associated with residual COCs in groundwater.
3) Type and degree of long-term management or monitoring	• A detailed monitoring plan is required to continue to demonstrate plume is in steady state. This alternative requires the least amount of resources. • Site NA will be significantly slower than traditional "MNA" and will likely not meet all the standard lines of evidence to demonstrate shorter term "MNA". • Site NA is primarily dispersion of metals along the groundwater flow paths and adsorption of metals to the saturated porous media.	• A detailed monitoring plan is required to demonstrate compliance and remediation progress throughout the post-injection program (5 years). • A full monitoring plan is required for executing and monitoring the injections and their immediate effects (2 years). • No maintenance injections are anticipated.	• A detailed monitoring plan is required to demonstrate compliance and remediation progress throughout the program (5-8 years). • A full O&M plan is required for executing and monitoring the work. • None to few maintenance injections are anticipated.	• A detailed monitoring plan is required to demonstrate compliance and remediation progress throughout the pumping and treatment program (20 years). • A full O&M plan is required for executing, maintaining and monitoring the system. • This alternative requires a high amount of resources such as a full-time plant operator, resources for pump maintenance, and equipment repair and replacement, as needed.	• A detailed monitoring plan is required to demonstrate compliance and remediation progress throughout the hydraulic containment and treatment program (20 years). • A full O&M plan is required for executing, maintaining and monitoring the system. • This alternative requires a high amount of resources such as a part-time plant operator, resources for pump maintenance, and equipment repair and replacement, as needed.	• A detailed monitoring plan is required to demonstrate compliance and remediation progress throughout the containment and treatment program (20 years). • A full O&M plan is required for executing, maintaining and monitoring the system. • This alternative requires a high amount of resources such as a part-time plant operator, resources for pump maintenance, and equipment repair and replacement, as needed.
Reliability Rating	**3**	**3**	**3**	**1**	**1**	**1**

Table 2

Evaluation of Remedial Alternatives for Groundwater at AOC 12
Montville Generating Station
Montville, CT

Evaluation Criteria	Alternative 1 Natural Attenuation (NA)	Alternative 2 Chemical Fixation Using EnviroBlend® Subsurface Aquifer Injections	Alternative 3 Chemical Fixation Using TerraBond® PRB Upgradient & EnviroBlend® PRB Downgradient	Alternative 4 Groundwater Pumping and Treatment	Alternative 5 Interceptor Trench for Hydraulic Containment and Groundwater Treatment	Alternative 6 Barrier Wall with Minimum Pumping and Treatment
C. Difficulty (Implementability) (Score 1-3)						
1) Technical complexity	• Implementation involves little complexity.	• Implementation involves moderate to high complexity (installation of 80 injection wells, installation of facilities, utilities, and injection of chemical reagents to injection wells across site).	• Implementation involves moderate to high complexity (installation of 25 TB and 25 EB injection wells [which constitute the PRBs], installation of facilities and injection of chemical reagents to injection wells across site).	• Implementation involves high complexity (significant modification of existing treatment building), treatment system, utilities, 24 extraction wells, 1,500 ft of above ground piping, and construction of manifold systems.	• Implementation involves high complexity (significant modification of existing treatment building), treatment system, utilities, 10 extraction wells, 950 ft of above ground piping, and construction of interceptor trench).	• Implementation involves high complexity (significant modification of existing treatment building), treatment system, utilities, 12 extraction wells, 1,300 ft of above ground piping, and construction of barrier wall).
2) Integration with facility operations	• No disruption to existing operations.	• Moderate disruption to existing operations to install 80 wells across the site.	• Low to moderate disruption to existing operations to install two PRBs across the length of the site.	• Moderate disruption to existing operations to install above-ground piping and significantly modify existing treatment building.	• Moderate disruption to existing operations to install above-ground piping and significantly modify existing treatment building.	• Moderate disruption to existing operations to install above-ground piping and significantly modify existing treatment building.
3) Site access requirements /limitations	• Site access for implementation is required but no limitations anticipated.	• Site access for implementation is required. There are moderate limitations to siting remedial facilities in this portion of the site, including existing storage tanks and piping.	• Site access for implementation is required. There are moderate limitations to siting remedial facilities in this portion of the site, including existing storage tanks and piping.	• Site access for implementation is required. There are some limitations to siting remedial facilities in this portion of the site, including existing storage tanks and piping.	• Site access for implementation is required. There are little to no limitations to siting remedial facilities in this portion of the site.	• Site access for implementation is required. There are little to no limitations to siting remedial facilities in this portion of the site.
4) Availability of services, materials, equipment or specialists.	• The services for implementation are readily available.	• The services, materials and equipment for implementation are moderately available.	• The services, materials and equipment for implementation are moderately available.	• The services, materials and equipment for implementation are moderately available.	• The services, materials and equipment for implementation are moderately available.	• The services, materials and equipment for implementation are moderately available.
5) Availability, capacity and location of off-site treatment, storage, and disposal facilities	• No off-site treatment needed.	• No off-site treatment needed.	• No off-site treatment needed.	• Off site treatment of liquid phase vessel media and spent particulate filters and cartridges required.	• Off site treatment of liquid phase vessel media and spent particulate filters and cartridges required.	• Off site treatment of liquid phase vessel media and spent particulate filters and cartridges required.
6) Permits	• No permitting required.	• Significant permitting required including natural resources and CTDEEP permits.	• Significant permitting required including natural resources and CTDEEP permits.	• Significant permitting required including natural resources, CTDEEP, NPDES, and construction and building permits.	• Significant permitting required including natural resources, CTDEEP, NPDES, and construction and building permits.	• Significant permitting required including natural resources, CTDEEP, NPDES, and construction and building permits.
Difficulty Rating	**3**	**1**	**2**	**1**	**1**	**1**
D. Cost (Score 1-5)						
1) Estimated cost of implementation	• Initial Investment: $1,000 • Annual O&M: $15,000 (20 years) • Net Present Value: $210,000	• Initial Investment: $2,900,000 • Annual O&M: $15,000 (2 years) • Net Present Value: $2,900,000	• Initial Investment: $550,000 • Annual O&M: $15,000 (3 years) • Net Present Value: $600,000	• Initial Investment: $1,300,000 • Annual O&M: $150,000 (20 years) • Net Present Value: $3,300,000	• Initial Investment: $1,200,000 • Annual O&M: $100,000 (20 years) • Net Present Value: $2,600,000	• Initial Investment: $1,800,000 • Annual O&M: $100,000 (20 years) • Net Present Value: $3,200,000
2) Cost of continuing energy consumption	• $100/year (fuel for machinery)	• $1,000/year (fuel for machinery)	• $1,000/year (fuel for machinery)	• >$50K/yr (included in annual O&M)	• >$50K/yr (included in annual O&M)	• >$50K/yr. (included in annual O&M)
Cost Rating	**5**	**2**	**4**	**1**	**2**	**1**
E. Risk of Implementation (Score 1-3)						
1) Relative risk to the community	• None	• None	• None	• None	• None	• None
2) Relative risk to workers	• Least risk during implementation.	• Moderate risk during implementation due to number of wells, chemical handling, and presence of existing infrastructure.	• Moderate risk during implementation due to project longevity, chemical handling, and presence of existing infrastructure.	• Moderate risk during implementation due to significant and intrusive construction activities and O&M.	• Moderate risk during implementation due to significant and intrusive construction activities and O&M.	• Moderate risk during implementation due to significant and intrusive construction activities and O&M.
3) Measures needed to mitigate erosion and sedimentation impacts	• None required.	• Moderate measures needed to mitigate erosion and sedimentation impacts due to construction.	• Moderate measures needed to mitigate erosion and sedimentation impacts due to construction.	• Moderate measures needed to mitigate erosion and sedimentation impacts due to construction including installing the wells and piping system.	• Significant measures needed to mitigate erosion and sedimentation impacts due to construction including installing the interceptor trench.	• Significant measures needed to mitigate erosion and sedimentation impacts due to construction including installing the barrier wall.
Risk Rating	**3**	**2**	**2**	**2**	**1**	**1**

Table 2

Evaluation of Remedial Alternatives for Groundwater at AOC 12
Montville Generating Station
Montville, CT

Evaluation Criteria	Alternative 1 Natural Attenuation (NA)	Alternative 2 Chemical Fixation Using EnviroBlend® Subsurface Aquifer Injections	Alternative 3 Chemical Fixation Using TerraBond® PRB Upgradient & EnviroBlend® PRB Downgradient	Alternative 4 Groundwater Pumping and Treatment	Alternative 5 Interceptor Trench for Hydraulic Containment and Groundwater Treatment	Alternative 6 Barrier Wall with Minimum Pumping and Treatment
F. Timeliness (Score 1-3)						
1) Time to Achieve Remedial Objective	• Extended treatment time (>20 years).	• Short treatment time: 2 years to execute injection program, which will fixate the majority of the impacted groundwater, and likely achieve compliance with alternative SWPC. • No maintenance injections are anticipated.	• Short to moderate treatment time: 5 years to execute injections, which will fixate the majority of the impacted groundwater, and achieve compliance with alternative SWPC. • None to few maintenance injections are anticipated.	• Once system is optimized, prevents additional discharge of impacted groundwater to surface water and river sediments, thus achieving compliance with alternative SWPC. • However, time to reduce arsenic concentrations onsite to <10 ug/l would be > 20 years.	• Immediately prevents additional discharge of impacted groundwater to surface water and river sediments, thus achieving compliance with alternative SWPC. • However, time to reduce arsenic concentrations onsite to <10 ug/l would be > 20 years.	• Immediately prevents additional discharge of impacted groundwater to surface water and river sediments, thus achieving compliance with alternative SWPC. • However, time to reduce arsenic concentrations onsite to <10 ug/l would be > 20 years.
Timeliness Rating	**1**	**3**	**3**	**2**	**2**	**2**
G. Green Benefits (Score 1-5)						
1) Minimizes energy use or uses renewable energy and resources	• No energy use.	• Moderate energy use (fuel consumption during implementation). Significant consumption of chemical reagents and water.	• Moderate energy use (fuel consumption during implementation). Significant consumption of chemical reagents and water.	• Highest energy use to operate pump and treatment system.	• High energy use to operate pump and treatment system.	• High energy use to operate pump and treatment system.
2) Minimizes air pollution or greenhouse gas emissions	• No air pollution.	• Moderate air pollution from fuel consumption during implementation.	• Moderate air pollution from fuel consumption during implementation.	• Highest air pollution (indirectly due to operation of pump and treatment system).	• High air pollution (indirectly due to operation of pump and treatment system).	• High air pollution (indirectly due to operation of pump and treatment system).
3) Reduce, reuse and recycle waste	• Option does not generate waste.	• Option generates minimal waste.	• Option generates minimal waste.	• This option will generate the most wastes, including liquid phase vessel media and spent particulate filters and cartridges required.	• This option will generate wastes, including liquid phase vessel media and spent particulate filters and cartridges required.	• This option will generate wastes, including liquid phase vessel media and spent particulate filters and cartridges required.
4) Protects land and ecosystem	• Land does not provide significant wildlife habitat needing protection. • Most protective of adjacent river resources due to lack of land disturbance.	• Land does not provide significant wildlife habitat needing protection. • Moderately protective of adjacent river resources due to E&SC measures during land disturbance.	• Land does not provide significant wildlife habitat needing protection. • Moderately protective of adjacent river resources due to E&SC measures during land disturbance, but activities take place close to shoreline.	• Land does not provide significant wildlife habitat needing protection. • Moderately protective of adjacent river resources due to E&SC measures during land disturbance.	• Land does not provide significant wildlife habitat needing protection. • Moderately protective of adjacent river resources due to E&SC measures during land disturbance, but activities take place close to shoreline.	• Land does not provide significant wildlife habitat needing protection. • Moderately protective of adjacent river resources due to E&SC measures during land disturbance, but activities take place close to shoreline.
5) Minimizes adverse visual and aesthetic impacts on receptors outside of the property	• No visual or aesthetic impacts.	• Low visual or aesthetic impacts.	• Low visual or aesthetic impacts.	• Moderate visual or aesthetic impacts.	• Significant visual or aesthetic impacts.	• Significant visual or aesthetic impacts.
Green Benefits Rating	**5**	**3**	**4**	**1**	**2**	**2**

Table 2

Evaluation of Remedial Alternatives for Groundwater at AOC 12
Montville Generating Station
Montville & Waterford, CT

Alternative #	Alternative Description	A	B	C	D	E	F	G	Score	Overall Ranking
1	Natural Attenuation (NA)	1	3	3	5	3	1	5	21	2
2	Chemical Fixation Using EnviroBlend® Subsurface Aquifer Injections	4	3	1	2	2	3	3	18	3
3	Chemical Fixation Using TerraBond™ PRB Upgradient & EnviroBlend® PRB Downgradient	4	3	2	4	2	3	4	22	1
4	Groundwater Pumping and Treatment	3	1	1	1	2	2	1	11	4
5	Interceptor Trench for Hydraulic Containment and Groundwater Treatment	2	1	1	2	1	2	2	11	4
6	Barrier Wall with Minimum Pumping and Treatment	2	1	1	1	1	2	2	10	5

Notes:

A. Effectiveness (E)
- 1 = Not widely used and probably not effective
- 2 = Widely used but probably not effective, or not widely used and may not be effective
- 3 = Widely used but may not be effective, or not widely used but probably effective
- 4 = Widely used and probably effective, or not widely used but proven and effective
- 5 = Widely used, proven, and effective

B Reliability (R1) (permanence)
- 1 = Low reliability and/or high maintenance
- 2 = Average reliability and/or average maintenance
- 3 = High reliability and/or low maintenance

C Difficulty (D) (comparative technical complexity, permitting, and disruptions to current operations)
- 1 = Most difficult to implement
- 2 = Moderate difficulty to implement
- 3 = Easiest to implement

D Cost (C)
- 1 = Highest relative cost compared to other alternatives
- 2 = Greater than #3, but less than the highest cost
- 3 = Greater than #4, but less than or equal to lowest cost plus 2/3 of difference between highest and lowest cost
- 4 = Greater than #5, but less than or equal to lowest cost plus 1/3 of difference between highest and lowest cost
- 5 = Lowest relative cost compared to other alternatives

E Risk (R2) (relative risk associated with implementation)
- 1 = Highest risks associated with implementation
- 2 = Moderate risk associated with implementation
- 3 = Lowest risk associated with implementation

F Time (T) (comparative timeliness to achieve the remediation objective)
- 1 = Extended treatment time
- 2 = Acceptable treatment time
- 3 = Rapid treatment

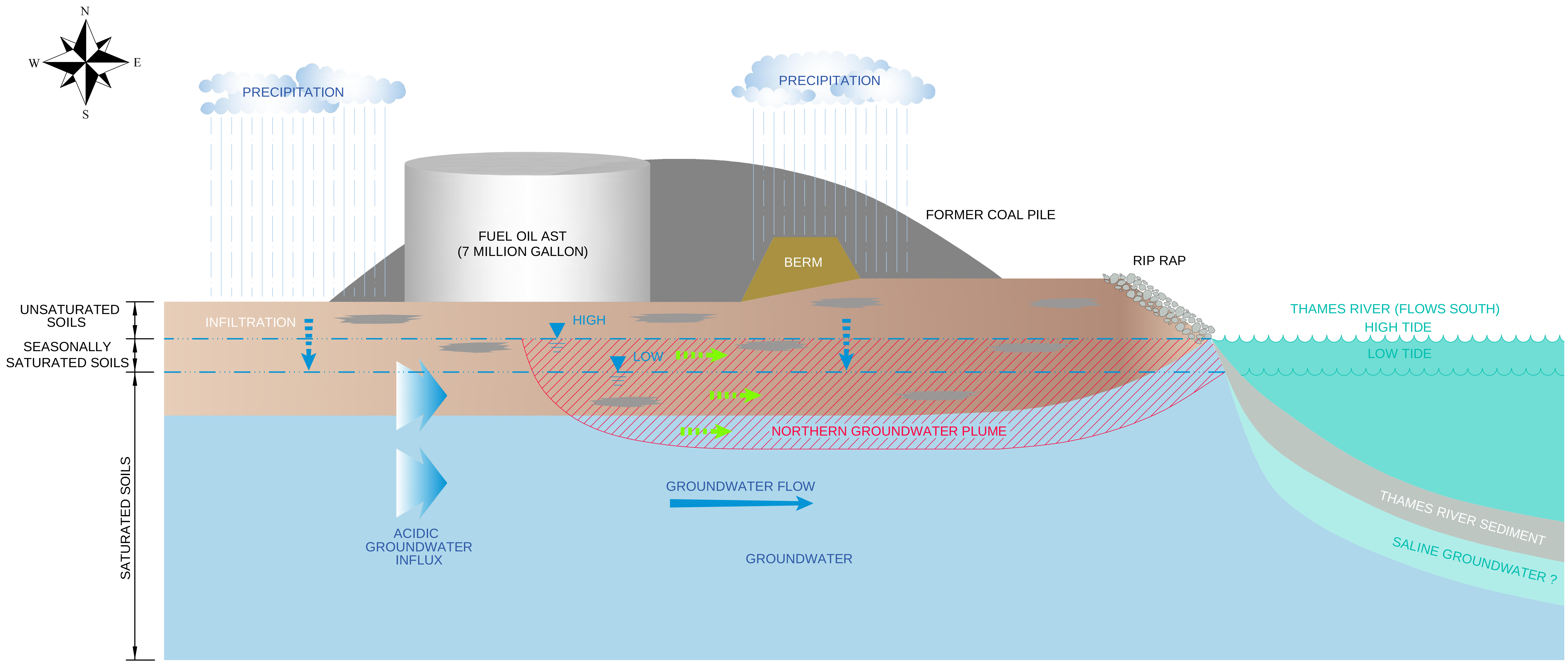
G Green Benefits (B)
- 1 = Low benefits
- 2 = Low to moderate benefits
- 3 = Moderate benefits
- 4 = Moderate to high benefits
- 5 = High benefits

Score = E + R1 + D + C + R2 + T + B; Possible scores are 7 to 27

Acronyms

AOC	-	Area of Concern	O&M	-	Operation and Maintenance
COC	-	Contaminants of Concern	PRB	-	Permeable Reactive Barrier
CTDEEP	-	Connecticut Department of Environmental	MNA	-	Monitored Natural Attenuation
NA	-	Natural Attenuation	SWPC	-	Surface Water Protection Criteria
NPDES	-	National Pollutant Discharge Elimination System			

FIGURES



THIS CONCEPTUAL SITE MODEL (CSM) IS A SYNTHESIS OF INFORMATION PREVIOUSLY PRESENTED. SOURCES OF INFORMATION USED:

- PHASE III REPORT
- PRELIMINARY TECHNICAL IMPRACTICABILITY ASSESSMENT FOR GROUNDWATER
- PROFESSIONAL JUDGMENT

THIS DRAWING PRESENTS A CSM OF THE HYDROLOGIC SETTING, CONTAMINANT SOURCES, RELEASE MECHANISMS AND TRANSPORT PATHWAYS, AND PLACES THEM IN A SPATIAL CONTEXT. IT PRESENTS A VISUAL SUMMARY OF ESTIMATED PROCESSES THAT OCCUR AT THE SITE.

LEGEND:

- COARSE SOIL IMPACTED WITH COAL AND COAL ASH (DARKER BROWN IS MORE IMPACTED THAN LIGHTER BROWN)
- FINE SOIL IMPACTED WITH COAL AND COAL ASH
- DIRECTION OF GROUNDWATER FLOW
- INFILTRATION FROM PRECIPITATION AND LEACHING OF METALS (CURRENT AND HISTORIC)
- MOBILIZATION OF METALS DUE TO ACIDIC GROUNDWATER INFLUX
- GROUNDWATER TABLE

NOTE:

MORE THAN 10X VERTICALLY EXAGGERATED CROSS SECTION OF THE SITE, LOOKING NORTH.

"NOT TO SCALE"

CB&I	SHAW ENVIRONMENTAL, INC. A CB&I COMPANY 150 ROYALL STREET CANTON, MA 02021
DESIGNED BY: RP	MONTVILLE GENERATING STATION MONTVILLE, CONNECTICUT
DRAWN BY: GJ CHECKED BY: AW/VT	MONTVILLE POWER, LLC CONCEPTUAL SITE MODEL NORTHERN PLUME
APPROVED BY: AW	DATE: 8/14/13 · SCALE: NA · DRAWING NO. 1009654011-D3 · SHEET NO. 1

OFFICE Pittsburgh, PA

DRAWING NUMBER 1009654011-D3

VERIFY SCALE 0 1"

Xref:
Image: CB&I.jpg

File: O:\Project\1009654011\1009654011-D3.dwg
Plot Date/Time: Aug 21, 2013 - 11:07am
Plotted By: greg.jones

APPENDIX A

Remedial Action Plan Transmittal Form

Bureau of Water Protection and Land Reuse
Remediation Division

Date Stamp
(DEP Use Only)

Remedial Action Plan Transmittal Form

This form is a cover to transmit a remedial action plan. When the use of this transmittal form is required or requested by the Commissioner, a remedial action plan approved in writing by the LEP, a copy of public notification of remediation, as well as all other documentation which demonstrates all applicable laws and regulations have been complied with, is to be attached to this transmittal form to document that remediation of the establishment has been initiated.

Part I of this form must be completed and signed by the Party responsible to submit a remedial action plan for the remediation of the parcel in accordance with the remediation standards. Part II of this form is to be completed and signed and sealed by a licensed environmental professional (LEP).

All sections of this form must be filled out, as applicable.

PART I: GENERAL INFORMATION

Remediation ID No. (Rem#): CTD049181654

Site Identification

Establishment Name (as on Form III): Montville Power LLC

Establishment Address: 74 Lathrop Road

City/Town: Montville & Waterford State: CT Zip Code: 06382

Description in Property Deed:

Recorded on page 0167 of volume 0333 of the Town of Montville

land records, as lot 001-000 block NA on map 123 in the Tax Assessor's Office.

Check the box indicating under which program this documentation is being submitted:

☒ Connecticut General Statutes (CGS) section 22a-134a(a)-(e), Property Transfer filing

☐ CGS section 22a-133x, Voluntary Remediation

☒ Other (specify) State RCRA

Submit this completed form to:

REMEDIATION DIVISION, 2ND FLOOR,
BUREAU OF WATER PROTECTION AND LAND REUSE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET, HARTFORD, CT 06106 - 5127

Remedial Action Plan Transmittal Form (continued)

Rem#: CTD049181654

PART I: GENERAL INFORMATION (continued)

The following documentation must be attached to this form. Check boxes, as applicable, to verify that the documentation has been submitted with this form.

☒ **REMEDIAL ACTION PLAN** - in accordance with CGS Section 22a-134a(g)(1)

Dated: Feb. 2016 Prepared by: CB&I Environmental & Infrastructure, Inc.

☒ **PUBLIC NOTICE OF REMEDIATION** - in accordance with CGS Section 22a-134a(i)

☒ copy of published notice in newspaper

☒ copy of notice to local Director of Health

Check the applicable box if additional public notice requirements were implemented and provide documentation.	☒ sign erected on establishment ☐ copies of the notice of remediation mailed to abutting property owners

Note: Certifying Party must provide copies of any written public comments and responses.

List Additional Documentation (as applicable) and attach to this form.

DOCUMENT	DATED	PREPARED BY

Certifying Party Certification

"I submit this form and attached remedial action plan approved by a licensed environmental professional. I shall apply for all permits and approvals that are necessary to carry out the remedial actions, and I shall ensure that any necessary permit applications are complete and that the issuance of any such permit and/or approval will be diligently pursued."

Marsal Martin
Printed Name of Authorized Signatory

Site Manager
Title

Marsal Martin
Signature of Authorized Signatory

2/25/16
Date

Representing (Name of Company): Montville Power LLC

Address: 74 Lathrop Road

City/Town: Montville State: CT Zip Code: 06382

Phone: 860-848-6017

Remedial Action Plan Transmittal Form (continued)

Rem#: CTD049181654

PART II: REMEDIAL ACTION PLAN SUMMARY

To be completed by the LEP

Groundwater Class: GA+B

Soil: Concentrations of Pollutants in Excess of RSR Criteria:

Criterion Exceeded	Remedial Measure	COC
☐ PMC	☐ in-situ	☐ non-chlorinated VOCs
☐ GA	☐ excavation / on-site re-use	☐ Chlorinated VOCs
☐ GB	☐ excavation & removal	☐ Metals
	☐ Engineered control Date of Commissioner Approval:	☐ PAHs
☐ DEC		☐ SVOCs
☐ Res	☐ ELUR	☐ PCBs
☐ I / C	☐ RSR exemption	☐ ETPH
	☐ RSR Alternative Criteria Date of Commissioner Approval:	☐ Pesticides
		☐ Other (specify):
	☐ Other (specify):	

Groundwater: Concentrations of Pollutants in Excess of RSR Criteria:

Criterion Exceeded	Remedial Measure	COC
	☐ Pump & Treat	☐ non-chlorinated VOCs
☐ GWPC	☐ Air Sparging / Vapor extraction	☐ Chlorinated VOCs
☐ Volatilization	☐ Dual-Phase	☒ Metals
☒ SWPC	☐ Monitored natural attenuation	☐ PAHs
	☒ ELUR	☐ SVOCs
	☐ RSR exemption	☐ PCBs
	☒ RSR Alternative Criteria	☐ ETPH
	Date of Commissioner Approval: March 13, 2013	☐ Pesticides
	☒ Other (specify): Chemical fixation	☐ Other (specify):

Remedial Action Plan Transmittal Form (continued)

Rem#: CTD049181654

Part II: Remedial Action Plan Summary (continued)

Vapor Intrusion:

Remedial Measure

☐ sub-slab depressurization

☐ vapor barrier

☐ indoor-air monitoring

Date of DPH Commissioner Approval of such plan:

NAPL present: ☐ Overburden ☐ Bedrock ☐ None

Other (specify):

LEP Approval

"I have personally examined and am familiar with the information in the remedial action plan summary of this transmittal form, and I approve the attached remedial action plan. My professional services have been rendered in accordance with the 'Rules of Professional Conduct' (Section 22a-133v-6 of the Regulations of Connecticut State Agencies)."

Andrew D. Walker — Printed Name of LEP

481 — License Number

A.D. Walker — Signature of LEP

2.25.2016 — Date

Company: CB&I Environmental & Infrastructure, Inc.

Address: 150 Royall Street

City/Town: Canton State: MA Zip Code: 02021

Phone: 617-589-6143

Affix Seal Here

STATE OF CONNECTICUT ★ ANDREW D WALKER ★ No. 481 Licensed ENVIRONMENTAL PROFESSIONAL

APPENDIX B

Remedial Action Plan Public Notice

[TO BE PUBLISHED IN *THE DAY* – 45 day public comment period]

NOTICE OF REMEDIATION

Montville Power LLC
Lathrop Road
Montville, CT

Pursuant to Connecticut regulations, a Remedial Action Plan (RAP) that details implementation of remedial action at the subject site has been prepared and submitted to the Connecticut Department of Energy & Environmental Protection (CTDEEP). The proposed remedial action includes chemical fixation of metals in groundwater at the subject property.

Response actions at this site will be conducted by Montville Power LLC that has employed Andrew D. Walker, of CB&I Environmental & Infrastructure, Inc., as Licensed Environmental Professional to manage response actions.

To obtain more information on the RAP and the opportunities for public involvement during its remediation, please contact Mr. Andrew D. Walker at 150 Royall Street, Canton, MA 02021 or at 617.589.6143.

Any public comments must be submitted in writing to the State by DATE. Please send the comments to the Commissioner at CTDEEP, 79 Elm Street, Hartford, CT 06106.

CB&I Environmental & Infrastructure, Inc.
150 Royall Street
Canton, MA 02021
Tel: +1 617 589 5111
Fax: +1 617 589 5495

March XX, 2016 | Project #: 1009644013.00321110

Mr. Patrick McCormack, Director of Health
Uncas Health District
401 West Thames Street, Building 100
Norwich, Connecticut 06360

Subject: Public Notice, Remedial Action Plan
Montville Generating Station
Montville, Connecticut

Dear Mr. McCormack:

Pursuant to Connecticut regulations, a Remedial Action Plan (RAP) that details implementation of remedial action at the subject site has been submitted to the Connecticut Department of Energy & Environmental Protection (CTDEEP). The proposed remedial action includes chemical fixation of metals in groundwater. On behalf of Montville Power LLC, attached please find a copy of the public notice for this remediation that will run in the The Day on DATE. In further compliance with CTDEEP requirements, a notice sign for this remediation will also be posted and maintained at the facility.

If you have any questions regarding this letter, please do not hesitate to call.

Sincerely,

Andrew D. Walker, LEP
Project Manager
CB&I Environmental & Infrastructure, Inc.

Phone: 617-589-6143
E-Mail Address: Andrew.Walker@CBI.com

Attachment: Public Notice

cc: Jessica Stefanowicz, CTDEEP (e-copy only)
William Warzecha, CTDEEP (e-copy only)
Juan Perez, USEPA (e-copy)
Bob Spooner, NRG (e-copy)
Ian Cambridge, Devon Power LLC (e-copy and hard copy)

APPENDIX C

Groundwater Flow and Solute Transport Modeling Results

APPENDIX C

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

February 10, 2016

Groundwater modeling was conducted for the Montville Generating Station located in Montville and Waterford, Connecticut, to evaluate groundwater flow and solute transport, and compare various groundwater remedial alternatives. The numerical model provided a comprehensive tool for fate and transport analysis that was used for remedial alternative evaluations. Solute transport models were created to evaluate the following remedial alternatives:

1. Natural Attenuation

2. Chemical Fixation Using EnviroBlend®

3. Chemical Fixation Using TerraBond® Permeable Reactive Barrier (PRB) Upgradient and EnviroBlend® PRB Downgradient

4. Groundwater Pumping and Ex-Situ Treatment

5. Interceptor Trench for Hydraulic Containment and Ex-Situ Groundwater Treatment

6. Barrier Wall with Minimal Groundwater Pumping and Ex-Situ Treatment

Solute transport modeling focused on arsenic, the primary compound of concern that is widespread in Area of Concern (AOC) 12 groundwater. The purpose of the solute transport modeling was to map the future extent of remedial standard exceedances (i.e., the metal plume dimensions) after the implementation of various remedial alternatives and to map the concentration distribution of arsenic within the plume over a 30-year period, a time frame considered to be reasonable in terms of demonstrating the technical impracticability of groundwater remediation.

The results of modeling of the alternatives are provided below. Graphical representations for each of the model alternatives are provided in **Figures 8-1** through **8-8**.

Natural Attenuation

The Natural Attenuation alternative predicted the fate and transport of arsenic if it is left alone to attenuate naturally. This alternative was performed without consideration of any treatment technologies to reduce contaminant concentrations.

Initial concentrations for arsenic were specified in the model based on average concentration data collected at monitoring wells across the site in 2012. The data included that from 33 wells screened within the shallow aquifer and distributed across the various AOCs at the site. The average concentrations at these 33 points were interpolated via the inverse distance weighted method to assign an initial concentration to each cell of the model grid. In addition, numerous “dummy” points were specified along the northern and eastern borders of the site along with several placed in the site interior to create a more realistic plume shape. The dummy points along the northern border adjacent to land were assigned a concentration of 0 micrograms per liter (µg/L) arsenic because the contamination is not believed to extent off-site to the north, while the dummy points adjacent to the river or within the site interior were assigned a background concentration of 1.6 µg/L arsenic. The

"Present (Starting Concentrations)" image depicted in **Figure 8-1** shows the initial distribution of arsenic in AOC 12.

Because no boundary conditions were changed for the Natural Attenuation alternative, no changes to the calibrated flow model were necessary.

After initial concentration data were input to the calibrated flow model, MT3D was used to predict changes over time if the Natural Attenuation alternative is implemented. The remaining graphics on **Figure 8-1** depict the predicted distribution of contaminants after 2, 5, 10, 20, and 30 years have passed. The model predicts insufficient contaminant reduction, as concentrations greater than the Connecticut Alternative Surface Water Protection Criteria (ASWPC) of 10 µg/L arsenic continue to be discharged to the Thames River even after 30 years.

The Natural Attenuation alternative formed the basis for the remaining alternatives.

Chemical Fixation Using EnviroBlend®

The Chemical Fixation Using EnviroBlend® alternative predicted the fate and transport of arsenic if the chemical blend is used to treat contaminated groundwater in-situ.

The alternative was modeled by first manipulating initial chemical concentrations input to the model to reflect contaminant reduction after in-situ treatment. The treatment area for arsenic included all areas in AOC 12 with an original starting concentration equal to or greater than 10 µg/L (based on the original interpolation described in the Natural Attenuation alternative), excluding areas where it is technically unfeasible to perform injections. This area encompassed approximately 2.2 acres (94,800 ft^2). External manipulation of the concentration data per cell was performed, where concentrations equal to or greater than 10 µg/L were set to 9.4 µg/L, reflecting the in-situ groundwater treatment. The "0 Years After Treatment" image depicted in **Figure 8-2** shows the targeted treatment area in AOC 12.

Because no boundary conditions were changed for the Chemical Fixation Using EnviroBlend® alternative, no changes to the calibrated flow model were necessary.

After the modified concentration data were input to the calibrated flow model, MT3D was used to predict changes over time if the Chemical Fixation Using EnviroBlend® alternative is implemented. **Figure 8-2** depicts the predicted arsenic concentration distribution after treatment and 2, 5, 10, 20, and 30 years after treatment. The model predicts arsenic concentrations would be reduced to the ASWPC at the river boundary within 2 years after treatment, but that arsenic concentrations above the ASWPC would remain in the site interior where it was unfeasible to perform injections; however, the high arsenic concentrations in the site interior would not discharge to the river after 30 years.

Chemical Fixation Using TerraBond® PRB Upgradient and EnviroBlend® Downgradient

The Chemical Fixation Using TerraBond® PRB Upgradient and EnviroBlend® Downgradient alternative predicted the fate and transport of arsenic if the chemicals are used upgradient or downgradient, respectively, to treat contaminated groundwater in-situ.

The alternative was modeled by first manipulating initial chemical concentrations input to the model to reflect contaminant reduction after in-situ treatment. The initial treatment area for arsenic included a 30-ft-wide north-south-trending strip to the east of the southeast aboveground tank, in which TerraBond® would be injected where original starting concentrations were equal to or greater than 20 µg/L (based on the original interpolation described in the Natural Attenuation alternative). External manipulation of the concentration data per cell was performed, where concentrations equal to or greater than 20 µg/L were set to 19 µg/L, reflecting the in-situ groundwater treatment. Each year thereafter, the TerraBond® chemical was assumed to travel 30 ft to the east, following groundwater flow, with the concentration data per cell manipulated to 19 µg/L, reflecting treatment. Five years after the TerraBond® injections, an EnviroBlend® PRB was modeled near the Thames River boundary to reduce the remaining arsenic concentrations to less than 10 µg/L prior to discharge to the river.

Because no boundary conditions were changed for the Chemical Fixation Using TerraBond® PRB Upgradient and EnviroBlend® Downgradient alternative, no changes to the calibrated flow model were necessary.

After the modified concentration data were input to the calibrated flow model, MT3D was used to predict changes over time if the Chemical Fixation Using TerraBond® PRB Upgradient and EnviroBlend® Downgradient alternative is implemented. **Figure 8-3** depicts the predicted arsenic concentration distribution after treatment and 1, 2, 3, 4, 5, 10, 20, and 30 years after treatment. The model predicts arsenic concentrations would be reduced to the ASWPC at the river boundary after 5 years after treatment, but that arsenic concentrations above the ASWPC would remain in the site interior west of the initial 30-ft strip of TerraBond® injections; however, the high arsenic concentrations west of the strip would not discharge to the river after 30 years.

Groundwater Pumping and Ex-Situ Treatment

The Groundwater Pumping and Ex-Situ Treatment alternative predicted the fate and transport of arsenic if extraction wells are installed and operated to remove and treat contaminated groundwater ex-situ.

Initial concentrations were the same as those used for the Natural Attenuation alternative.

Boundary conditions were changed such that extraction wells (using the Well package) were added to the flow model to remove contaminated groundwater. Pumping wells were initially placed in hotspot areas located centrally in the AOC 12 arsenic plume. After initial runs indicated that placement of wells in hotspot areas was not effective at significant reduction of contaminant concentrations, more wells were placed in an effort to capture as much arsenic as possible prior to discharge to the river. No wells were placed in areas where it was technically unfeasible to extract water, and these areas were left to naturally attenuate in the model.

A total of 24 extraction wells were placed in the model with individual pumping rates ranging up to 10.4 gallons per minute. Individual pumping rates were largely dependent on hydraulic conductivity and saturated thickness of the aquifer at individual locations. The lower pumping rates at many locations were necessary to minimize the possibility of any wells going dry during the course of the extraction system operation. With all extraction wells operating, a total of 56 gallons per minute groundwater would be withdrawn from the aquifer at a maximum depth of 20 ft. below the top of the static water level prior to pumping (i.e., the model bottom). MODFLOW was used to simulate the predicted flow model under pumping conditions. MODPATH was used to display the predicted path lines. The well placement and resultant capture zones are shown on **Figure 8-4**.

After initial concentration data were input to the revised flow model, MT3D was used to predict changes over time if the Groundwater Pumping and Ex-Situ Treatment alternative is implemented. **Figure 8-5** depicts the predicted arsenic concentration distribution after 2, 5, 10, 20, and 30 years have passed. The model predicts arsenic concentrations would be reduced to the ASWPC at the river boundary within 30 years after treatment, but that arsenic concentrations above the ASWPC would remain in the site interior.

Interceptor Trench for Hydraulic Containment and Ex-Situ Groundwater Treatment

The Interceptor Trench for Hydraulic Containment and Ex-Situ Groundwater Treatment alternative predicted the fate and transport of arsenic if trenches are installed to intercept and treat contaminated groundwater ex-situ.

Initial concentrations were the same as those used for the Natural Attenuation alternative.

Boundary conditions were changed such that trenches (using the Drain package) were added to the flow model to intercept contaminated groundwater prior to discharge to the wetlands. The depths of trenches were assigned such that there was a sufficient cone of depression for path lines to discharge into the trenches. After multiple model runs using varying trench depths, this was achieved by setting the bottom of the trench depths to an elevation of -7 ft. above mean sea level (MSL).

Two connected trench segments were placed in the model with individual pumping rates set at either 1.1 gallons per minute (shorter trench on the north side) or 105.8 gallons per minute (longer trench on the south side, located in a zone of higher hydraulic conductivity). Together, the trenches would be able to operate at the rate of 106.9 gallons per minute for water removal from the trenches. MODFLOW was used to simulate the predicted flow model under pumping conditions. MODPATH was used to display the predicted path lines. The trench placement and capture zones showing flow into the trenches under pumping conditions is shown on **Figure 8-6**.

After initial concentration data were input to the revised flow model, MT3D was used to predict changes over time if the Interceptor Trench for Hydraulic Containment and Ex-Situ Groundwater Treatment alternative is implemented. **Figure 8-7** depicts the predicted arsenic concentration distribution after 2, 5, 10, 20, and 30 years have passed. The model predicts arsenic concentrations would be reduced to the ASWPC at the river boundary within 10 years after trench installation, but that arsenic concentrations above the ASWPC would remain in the site interior.

Barrier Wall with Minimal Groundwater Pumping and Ex-Situ Treatment

The Barrier Wall with Minimal Groundwater Pumping and Ex-Situ Treatment alternative predicted the fate and transport of arsenic if extraction wells are installed and operated to remove and treat contaminated groundwater ex-situ and a low-permeability barrier walls is installed along the river.

The alternative was modeled by first manipulating initial chemical concentrations input to the model at the river boundary east of the barrier wall to reflect contaminant removal when the barrier is installed. Immediately adjacent to the river, it was assumed that tides would wash away any remaining arsenic contamination. The remaining initial concentrations in west of the barrier were the same as those used for the Natural Attenuation alternative.

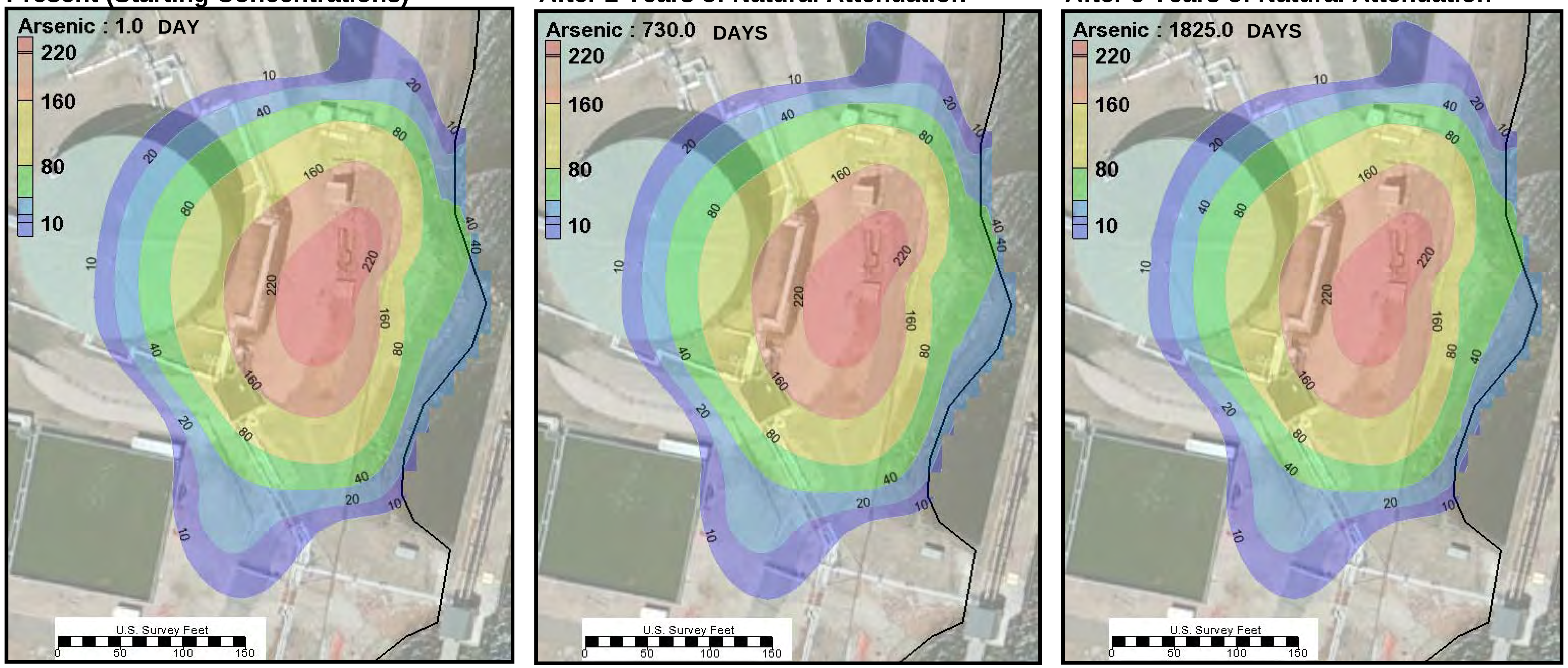
Boundary conditions were changed such that extraction wells (using the Well package) were added to the flow model to remove contaminated groundwater. In addition, the barrier wall was modeled by selecting cells in the MODFLOW grid that were contiguous with the river and one adjacent interior cell and manually setting hydraulic conductivity to 0.283 ft./day. The two cells closest to the river were selected, instead of just one cell adjacent to the river, because it was considered more technically feasible to install a barrier located 10 to 20 ft. from the river (interior cell) than it was 0 to 10 ft. from the river (cell contiguous with the river).

As few wells as possible were placed in the model in order to reduce arsenic concentrations to achieve containment of arsenic prior to discharge to the river. A total of 12 extraction wells were placed in the model with individual pumping rates ranging up to 5.2 gallons per minute. Individual pumping rates were largely dependent on hydraulic conductivity and saturated thickness of the aquifer at individual locations. The lower pumping rates at some locations were necessary to minimize the possibility of any wells going dry during the course of the extraction system operation. With all extraction wells operating, a total of 22 gallons per minute groundwater would be withdrawn from the aquifer at a maximum depth of 20 ft. below the top of the static water level prior to pumping (i.e., the model bottom). MODFLOW was used to simulate the predicted flow model under pumping conditions. MODPATH was used to display the predicted path lines. The well placement and resultant capture zones are shown on **Figure 8-8**.

After initial concentration data were input to the revised flow model, MT3D was used to predict changes over time if the Barrier Wall with Minimal Groundwater Pumping and Ex-Situ Treatment alternative is implemented. **Figure 8-9** depicts the predicted arsenic concentration distribution after 2, 5, 10, 20, and 30 years have passed. The model predicts arsenic concentrations would be reduced to the ASWPC at the river boundary for at least 5 years, but that some water with arsenic concentrations slightly above the ASWPC may travel past the barrier after 10 to 30 years. In addition, within 30 years after treatment, arsenic concentrations above the ASWPC would remain in the site interior.

FIGURES

Present (Starting Concentrations) | **After 2 Years of Natural Attenuation** | **After 5 Years of Natural Attenuation**



NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Values are interpolated from arsenic concentrations detected in groundwater monitoring well samples in 2012.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2\Montville10-2.gpr.

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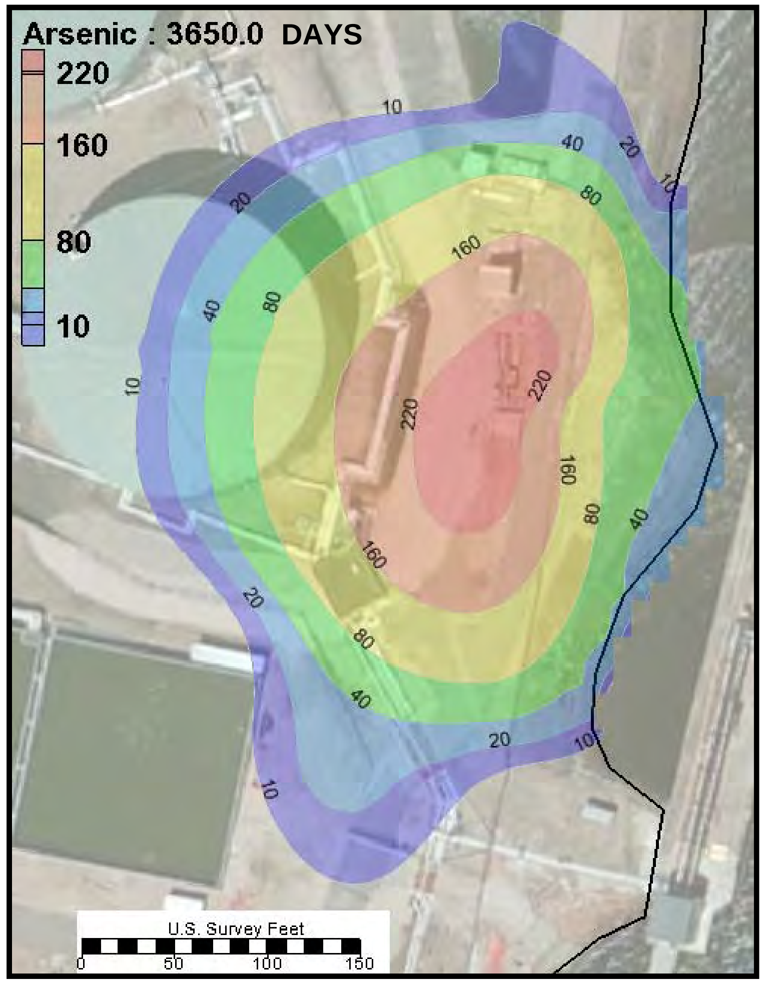
FIGURE 8-1 (SHEET 1 OF 2)

AOC 12 GROUNDWATER MODELING RESULTS FOR NATURAL ATTENUATION ALTERNATIVE

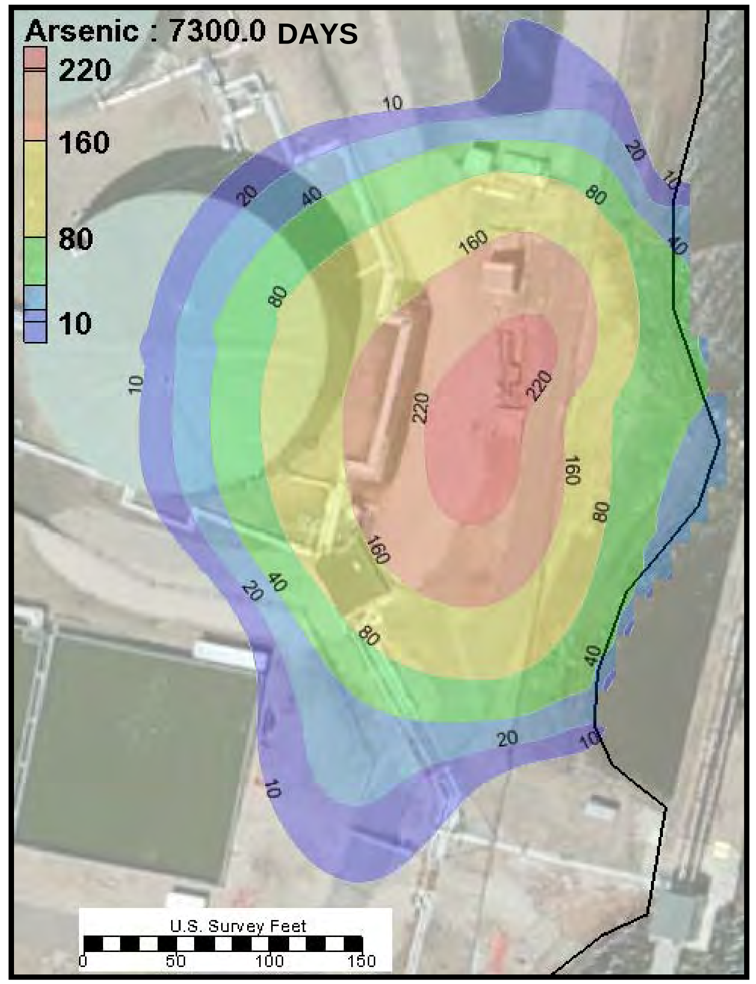
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

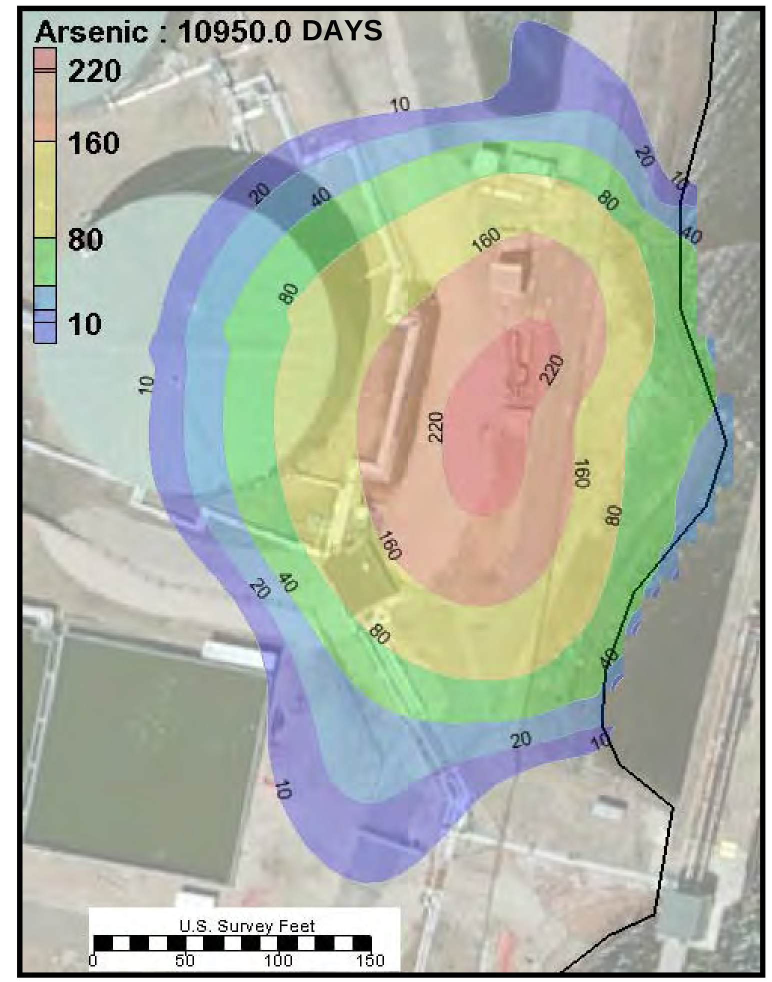
After 10 Years of Natural Attenuation



After 20 Years of Natural Attenuation



After 30 Years of Natural Attenuation



N

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Values are interpolated from arsenic concentrations detected in groundwater monitoring well samples in 2012.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2\Montville10-2.gpr.

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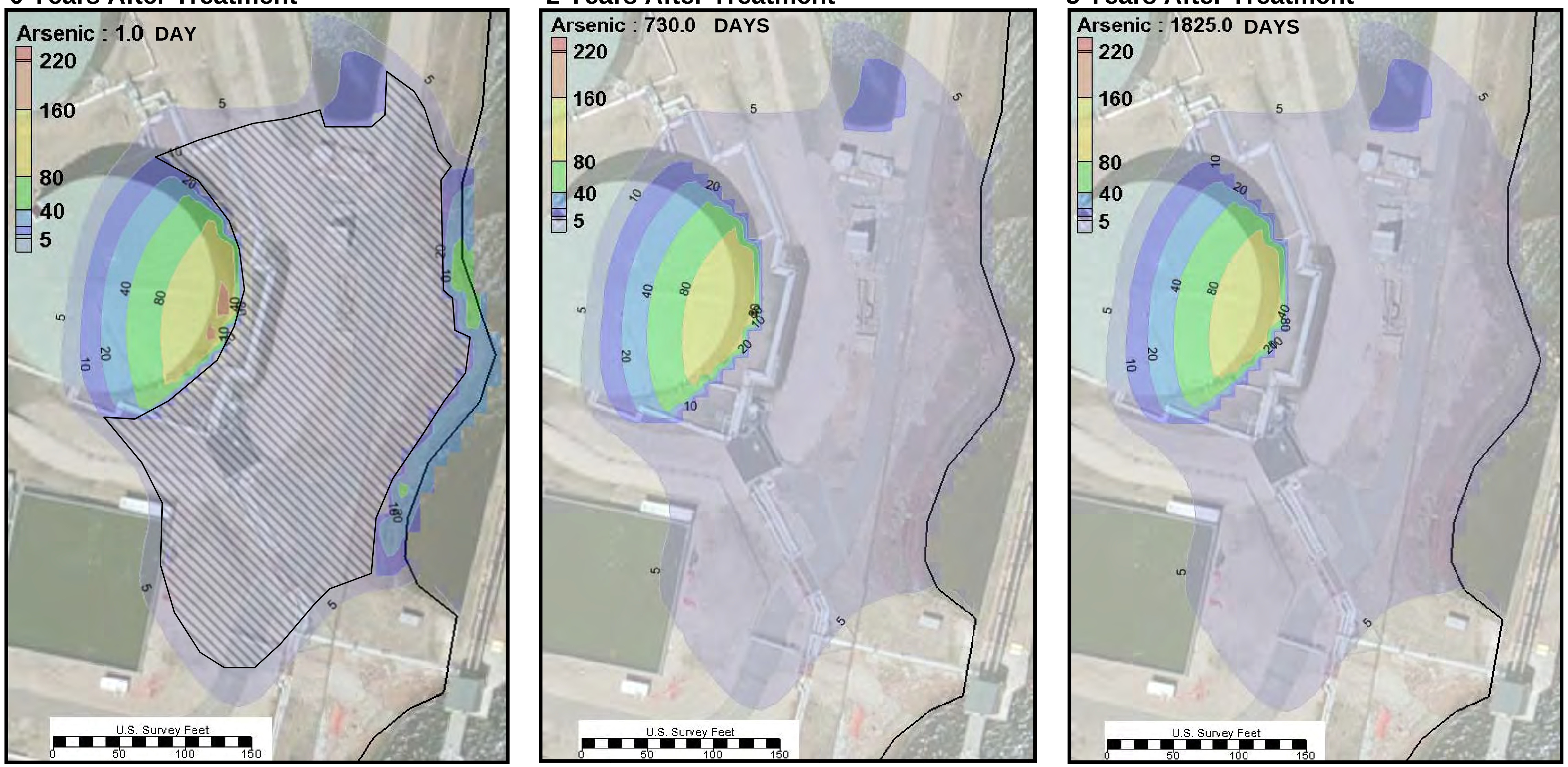
FIGURE 8-1 (SHEET 2 OF 2)

AOC 12 GROUNDWATER MODELING RESULTS FOR NATURAL ATTENUATION ALTERNATIVE

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

0 Years After Treatment | 2 Years After Treatment | 5 Years After Treatment



LEGEND:

Treatment Area

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes that arsenic concentrations greater than 10 µg/L will be treated with EnviroBlend except where technically unfeasible, and that once treated, these areas remain below 10 µg/L arsenic without additional injections.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2chemfix2\Montville10-2.gpr.

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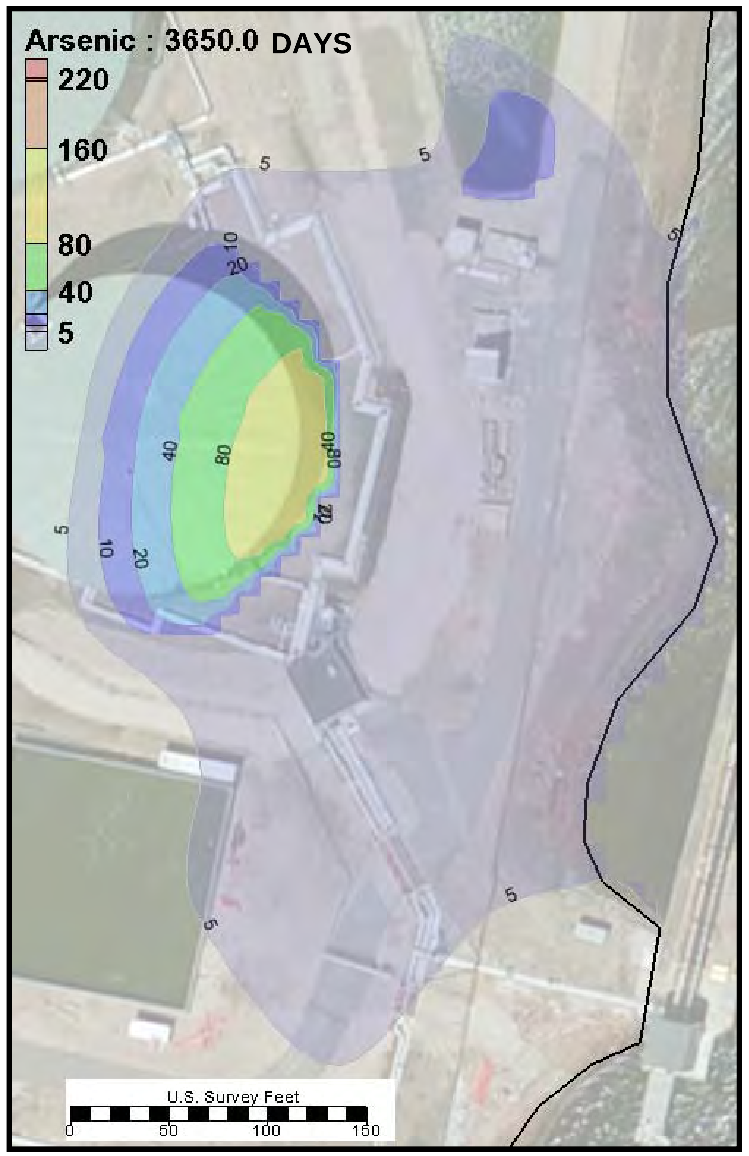
FIGURE 8-2 (SHEET 1 OF 2)

AOC 12 GROUNDWATER MODELING RESULTS FOR CHEMICAL FIXATION USING ENVIROBLEND® ALTERNATIVE

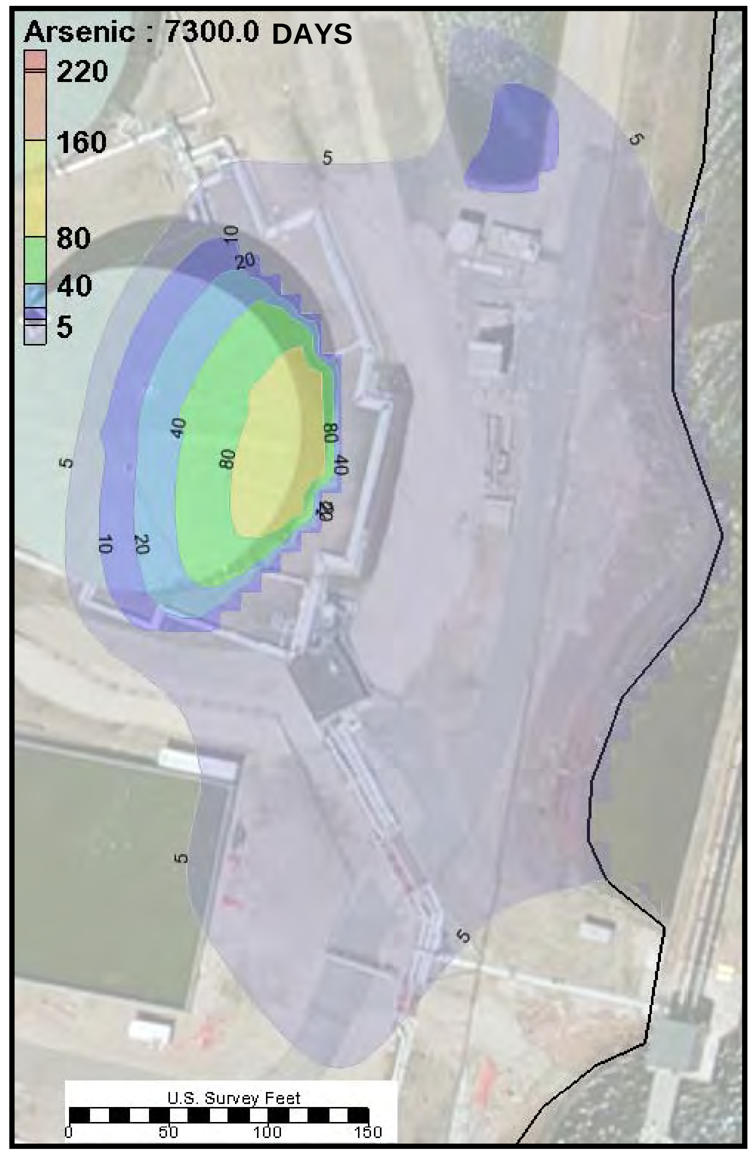
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

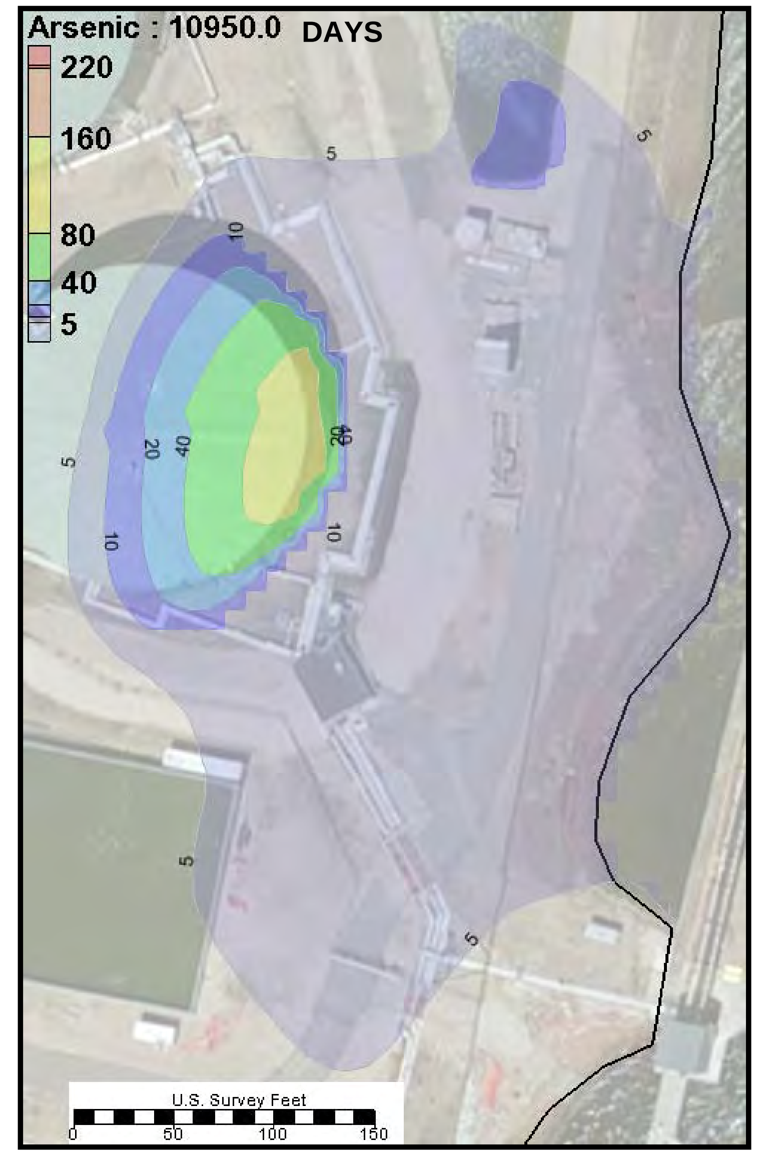
10 Years After Treatment



20 Years After Treatment



30 Years After Treatment



N

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes that arsenic concentrations greater than 10 µg/L will be treated with EnviroBlend except where technically unfeasible, and that once treated, these areas remain below 10 µg/L arsenic without additional injections.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2chemfix2\Montville10-2.gpr.

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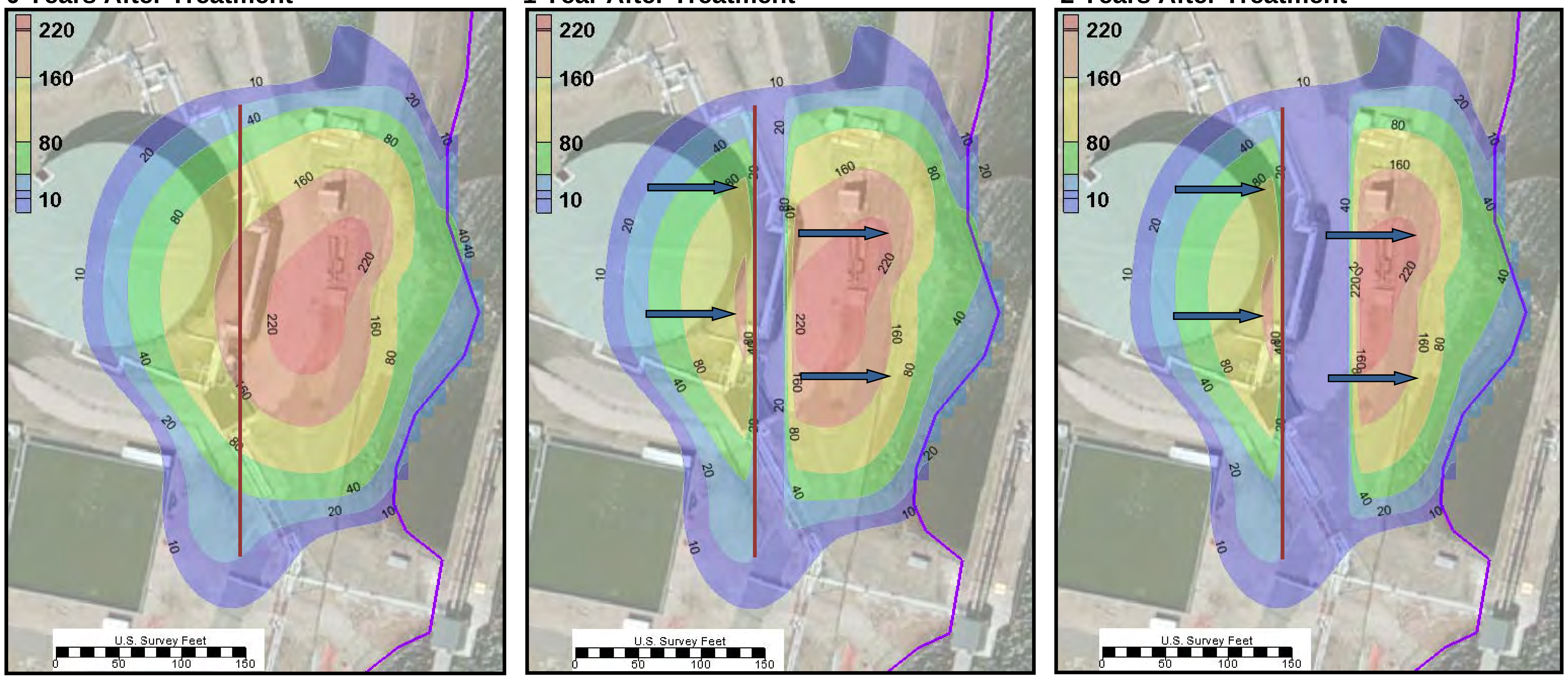
FIGURE 8-2 (SHEET 2 OF 2)

AOC 12 GROUNDWATER MODELING RESULTS FOR CHEMICAL FIXATION USING ENVIROBLEND® ALTERNATIVE

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

0 Years After Treatment | 1 Year After Treatment | 2 Years After Treatment



N

LEGEND:

TerraBond PRB via Shallow Injection Wells

Groundwater Flow Direction

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes that arsenic concentrations greater than 20 µg/L will be treated with TerraBond to less than 20 µg/L in a 30-foot-wide north-south-trending strip to the east of the aboveground tank. The scenario assumes the chemical will travel easterly with groundwater flow and treat arsenic concentrations to less than 20 µg/L as it comes into contact with them. The scenario assumes that, five years after the TerraBond injections, an EnviroBlend PRB will be placed near the river, reducing remaining arsenic concentrations to < 10 ug/L prior to discharging to the river.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2treatmentbarrier\Montville10-2.gpr.

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FIGURE 8-3 (SHEET 1 OF 3)

AOC 12 GROUNDWATER MODELING RESULTS FOR CHEMICAL FIXATION USING TERRABOND PERMEABLE REACTIVE BARRIER (PRB) UPGRADIENT AND ENVIROBLEND® PRB DOWNGRADIENT ALTERNATIVE

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

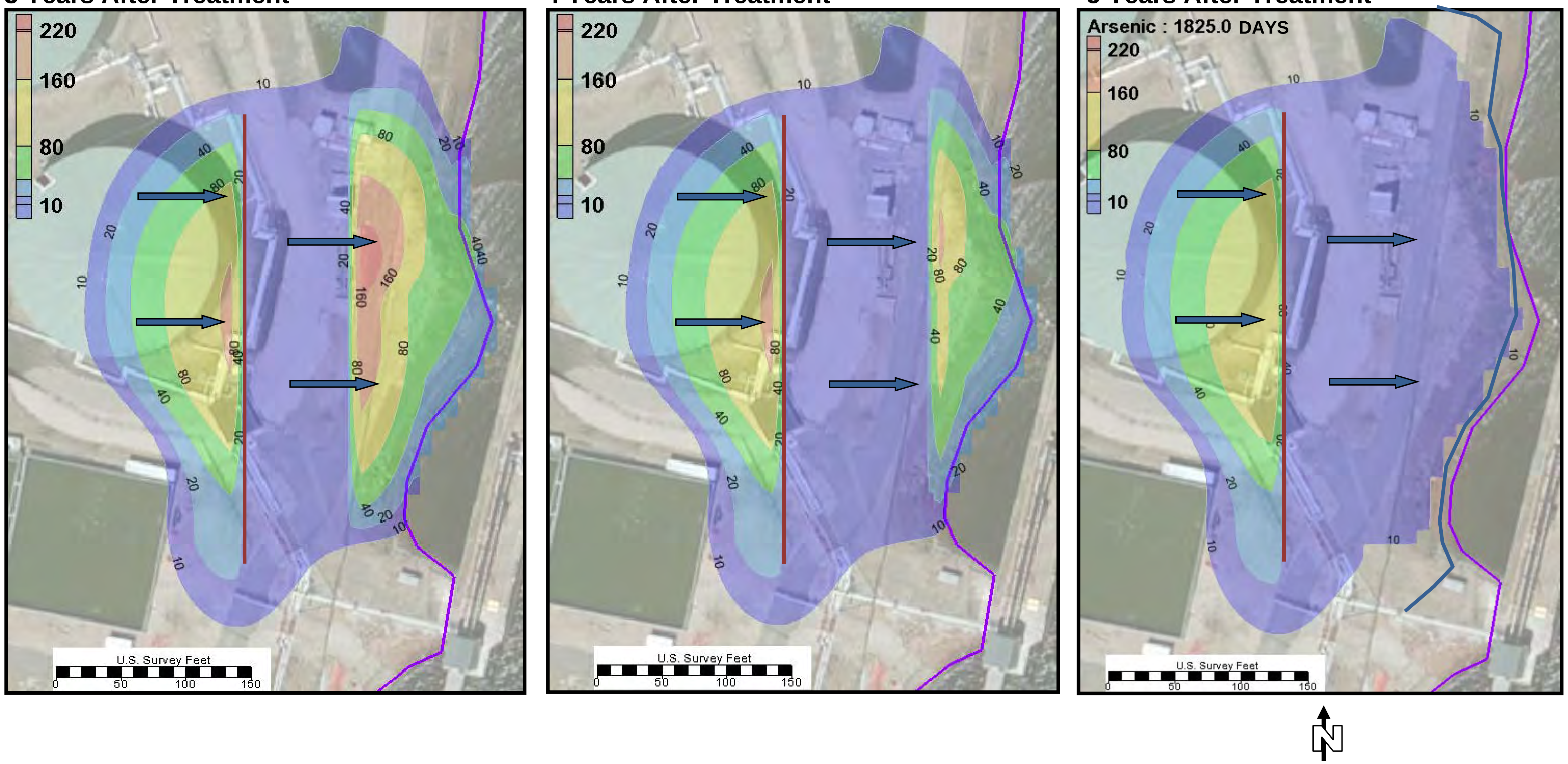
LEGEND:

TerraBond PRB via Shallow Injection Wells

EnviroBlend PRB via Shallow Injection Wells

Groundwater Flow Direction

3 Years After Treatment   4 Years After Treatment   5 Years After Treatment



NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes that arsenic concentrations greater than 20 µg/L will be treated with TerraBond to less than 20 µg/L in a 30-foot-wide north-south-trending strip to the east of the aboveground tank. The scenario assumes the chemical will travel easterly with groundwater flow and treat arsenic concentrations to less than 20 µg/L as it comes into contact with them. The scenario assumes that, five years after the TerraBond injections, an EnviroBlend PRB will be placed near the river, reducing remaining arsenic concentrations to < 10 ug/L prior to discharging to the river.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2treatmentbarrier\ Montville10-2.gpr.

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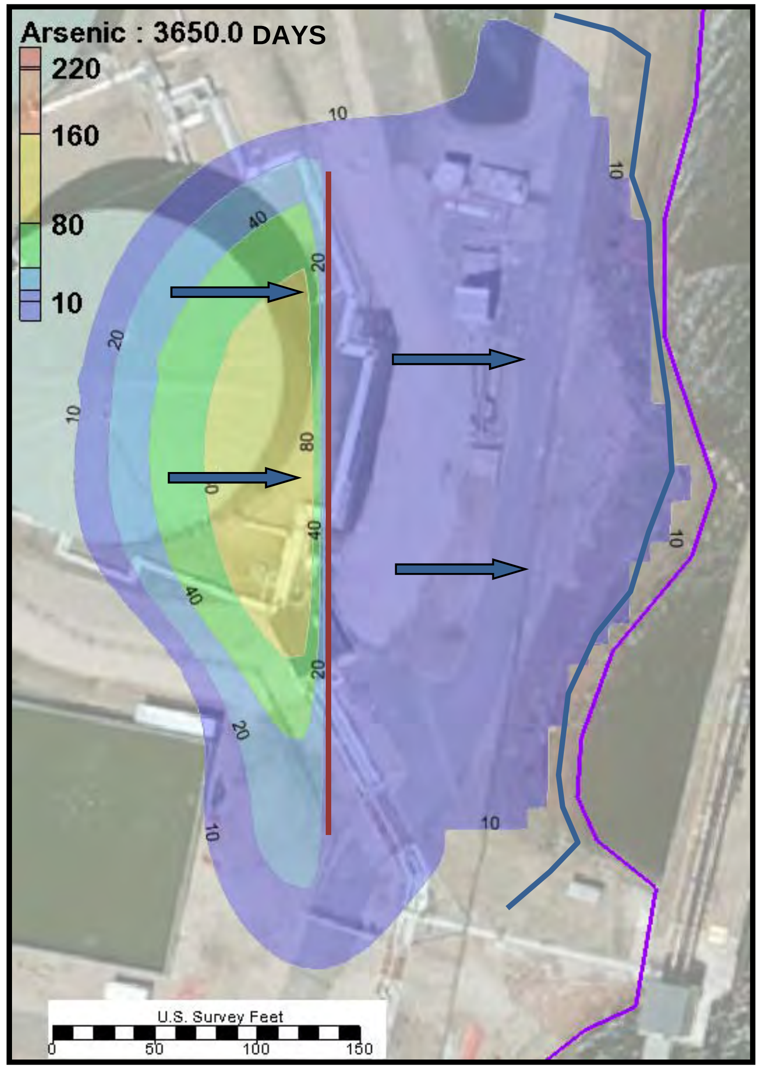
FIGURE 8-3 (SHEET 2 OF 3)

AOC 12 GROUNDWATER MODELING RESULTS FOR CHEMICAL FIXATION USING TERRABOND PERMEABLE REACTIVE BARRIER (PRB) UPGRADIENT AND ENVIROBLEND® PRB DOWNGRADIENT ALTERNATIVE

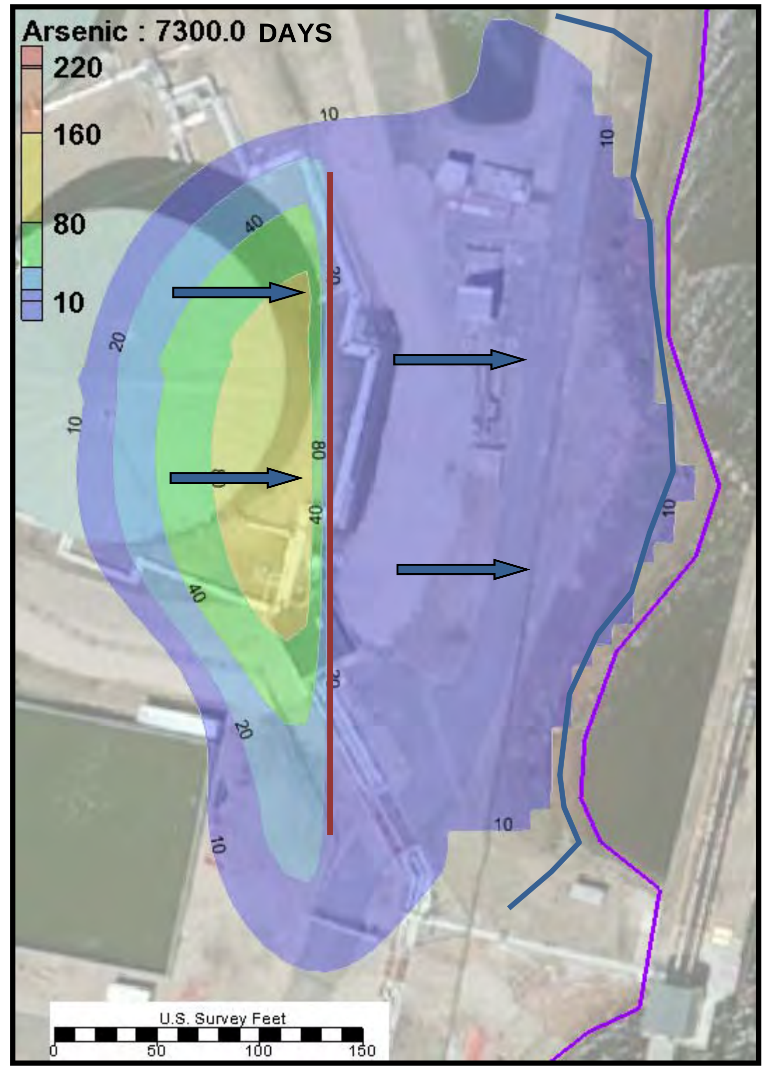
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

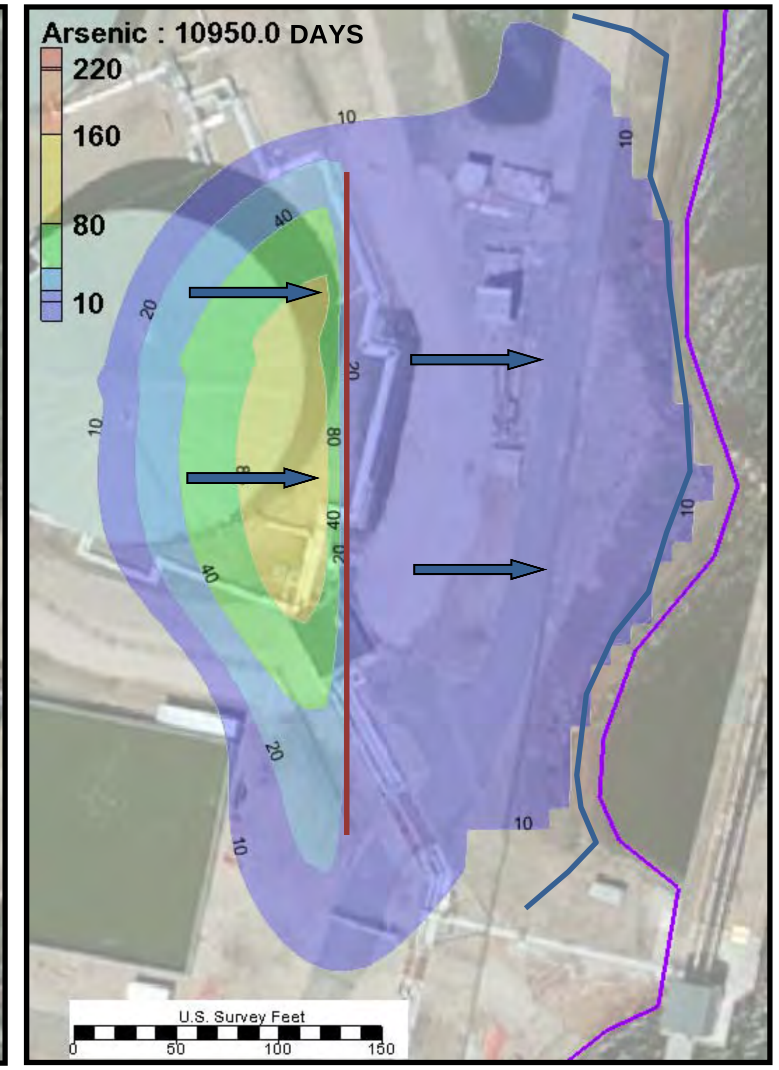
10 Years After Treatment



20 Years After Treatment



30 Years After Treatment



N

LEGEND:

TerraBond PRB via Shallow Injection Wells

EnviroBlend PRB via Shallow Injection Wells

Groundwater Flow Direction

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes that arsenic concentrations greater than 20 µg/L will be treated with TerraBond to less than 20 µg/L in a 30-foot-wide north-south-trending strip to the east of the aboveground tank. The scenario assumes the chemical will travel easterly with groundwater flow and treat arsenic concentrations to less than 20 µg/L as it comes into contact with them. The scenario assumes that, five years after the TerraBond injections, an EnviroBlend PRB will be placed near the river, reducing remaining arsenic concentrations to < 10 ug/L prior to discharging to the river.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2treatmentbarrier\Montville10-2.gpr.

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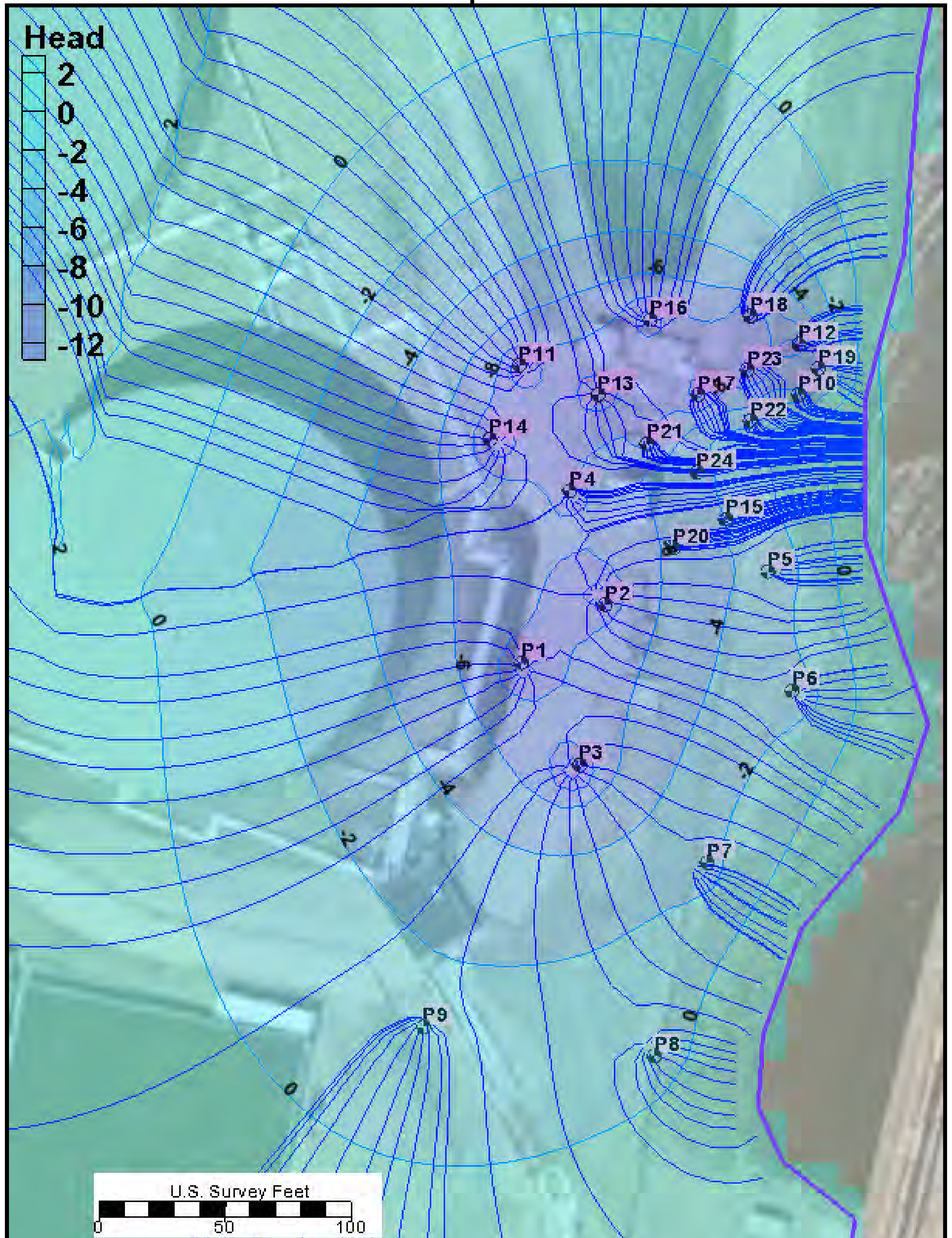
FIGURE 8-3 (SHEET 3 OF 3)

AOC 12 GROUNDWATER MODELING RESULTS FOR CHEMICAL FIXATION USING TERRABOND PERMEABLE REACTIVE BARRIER (PRB) UPGRADIENT AND ENVIROBLEND® PRB DOWNGRADIENT ALTERNATIVE

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

Water Table Contours with Well Capture Zones



ID	Pumping Rate	
	(feet/day)	(GPM)
P1	1250.0	6.49
P2	1250.0	6.49
P3	2000.0	10.39
P4	300.0	1.56
P5	1000.0	5.19
P6	1250.0	6.49
P7	1000.0	5.19
P8	1000.0	5.19
P9	500.0	2.60
P10	150.0	0.78
P11	75.0	0.39
P12	100.0	0.52
P13	50.0	0.26
P14	75.0	0.39
P15	75.0	0.39
P16	75.0	0.39
P17	75.0	0.39
P18	75.0	0.39
P19	125.0	0.65
P20	75.0	0.39
P21	75.0	0.39
P22	75.0	0.39
P23	75.0	0.39
P24	75.0	0.39

LEGEND:

P1 Extraction Well ID

-2 Water Table Contours

Groundwater Flow Path Toward Extraction Well

NOTES:

1. Water table contours are displayed in feet above mean sea level.
2. Well capture zones show the paths a hypothetical "particle" (contaminant) would travel based on groundwater flow while the wells are actively pumping.
3. Water removed by extraction well pumping will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
4. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MODPATH File ID Montville10-2pump9\Montville10-2.gpr.

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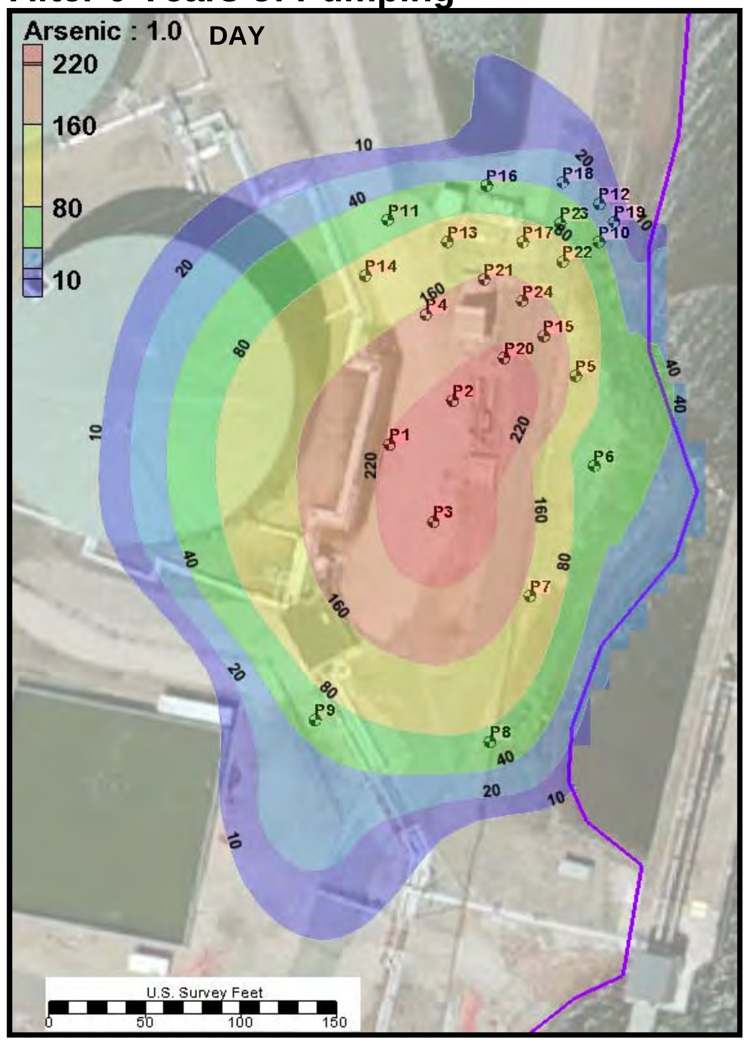
FIGURE 8-4 (SHEET 1 OF 1)

GROUNDWATER PUMPING AND TREATMENT ALTERNATIVE - CAPTURE ZONES

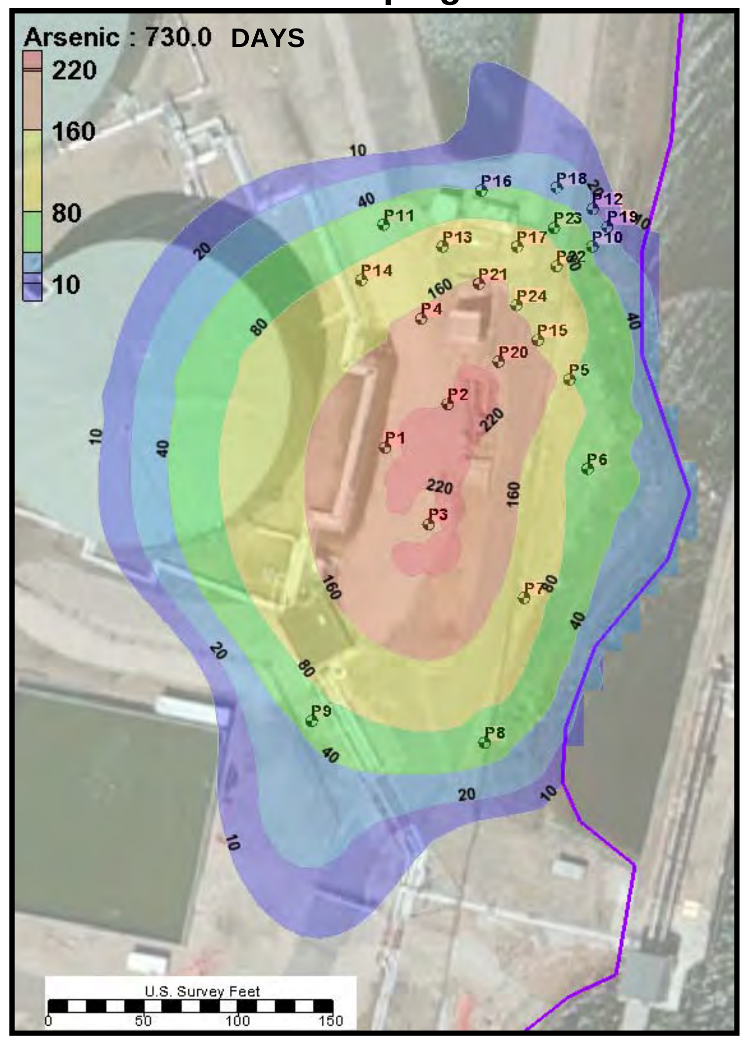
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

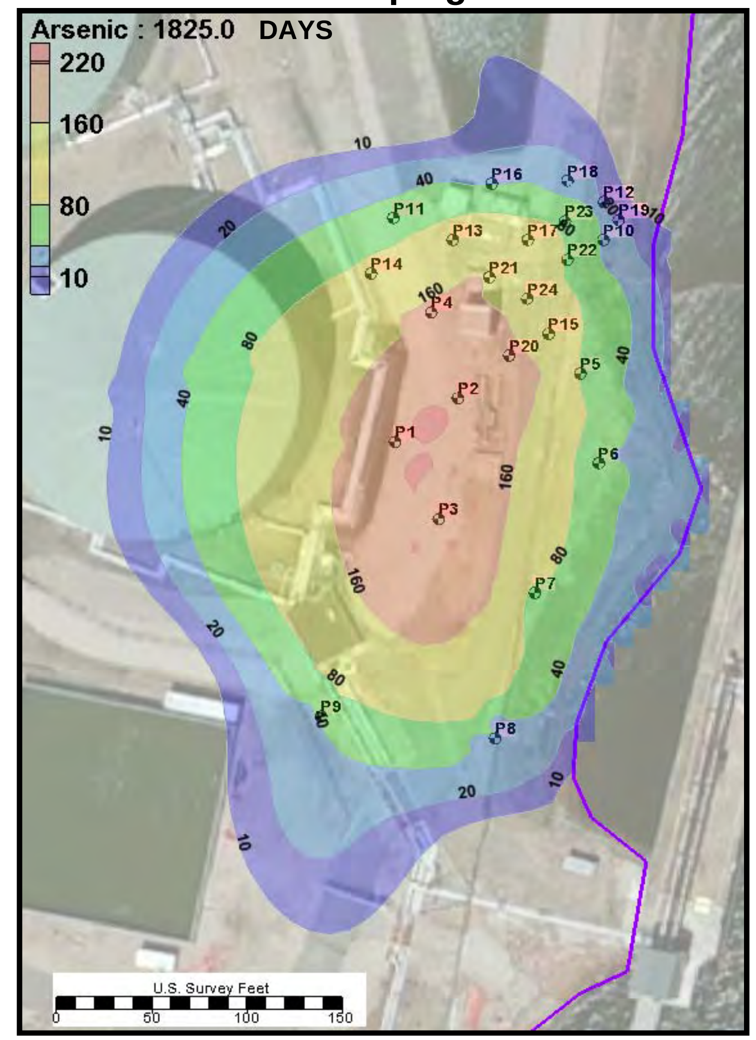
After 0 Years of Pumping



After 2 Years of Pumping



After 5 Years of Pumping



N

LEGEND:

P1 Extraction Well ID

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes water removed by extraction well pumping will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2pump9\Montville10-2.gpr.

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FIGURE 8-5 (SHEET 1 OF 2)

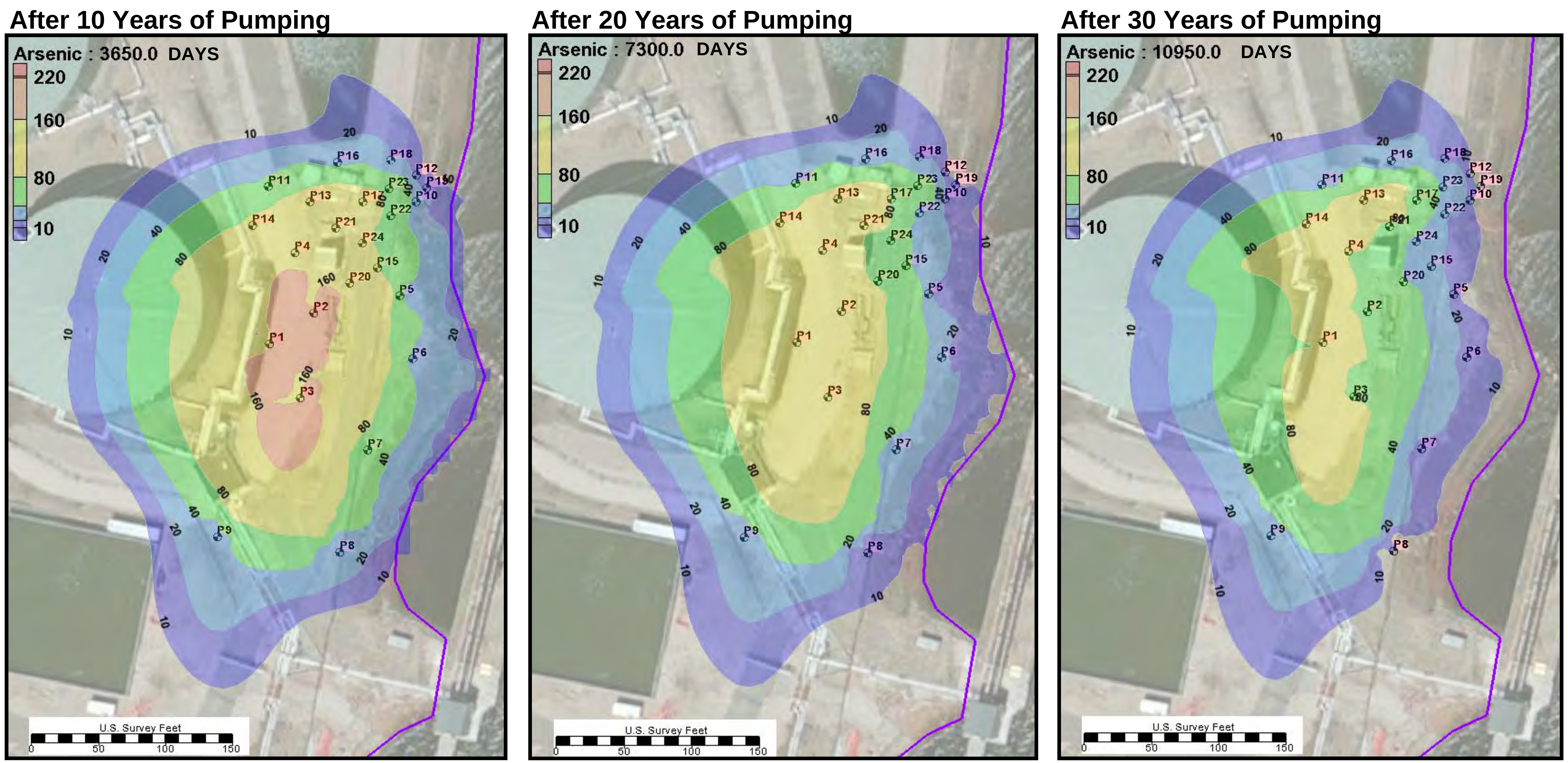
AOC 12 GROUNDWATER MODELING RESULTS FOR PUMPING AND TREATMENT ALTERNATIVE

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

LEGEND:

P1 Extraction Well ID



NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes water removed by extraction well pumping will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
3. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2pump9\Montville10-2.gpr.

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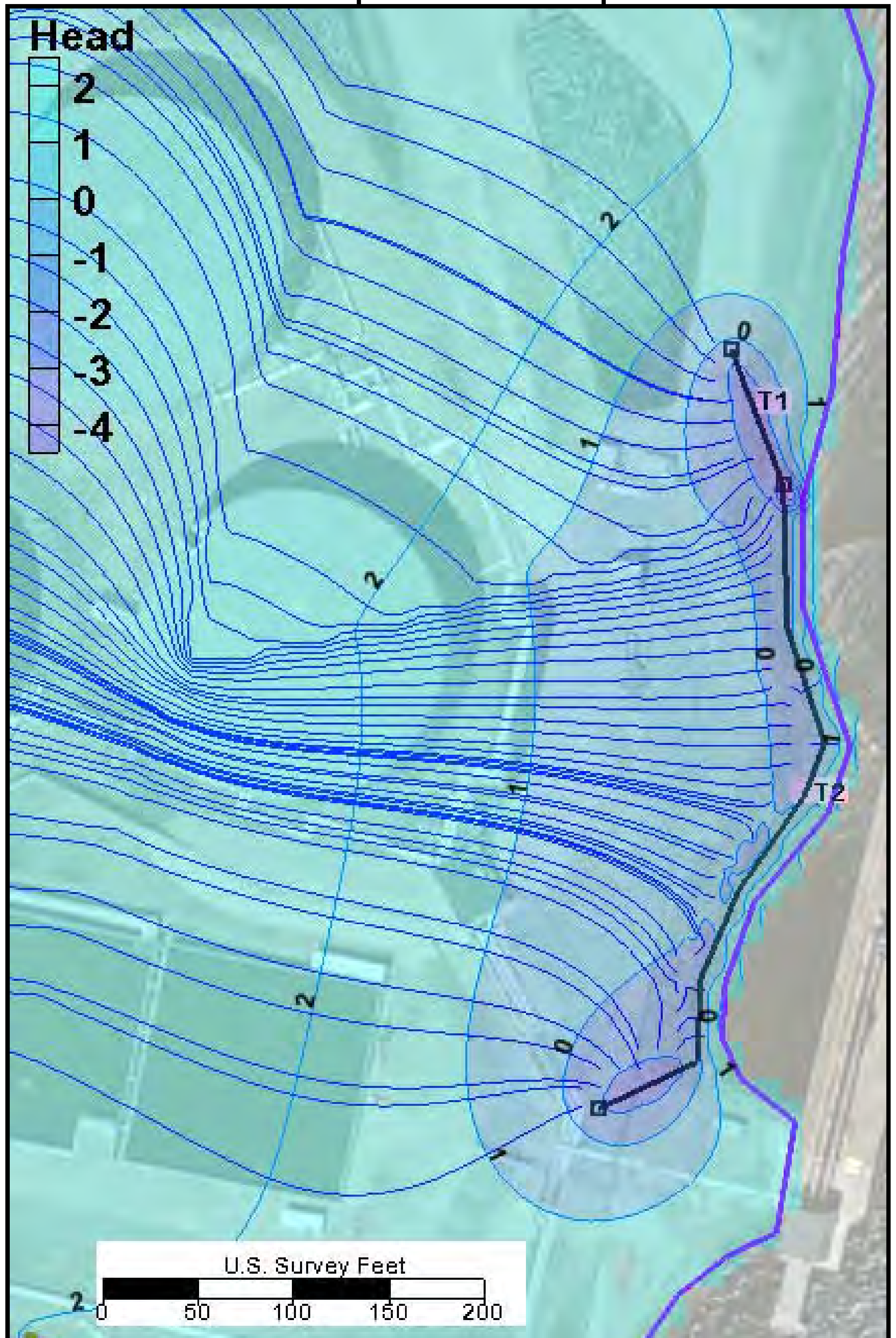
FIGURE 8-5 (SHEET 2 OF 2)

AOC 12 GROUNDWATER MODELING RESULTS FOR PUMPING AND TREATMENT ALTERNATIVE

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

Water Table Contour Map with Trench Capture Zone



Trench Details

Trench ID	Depth (ft amsl)	Length (ft)	Flow into Trench (ft^3/day)	Pumping Rate (gal/min)
T1	-7	76.5	217.26	1.13
T2	-7	379.4	20,367.80	105.81

LEGEND:

T1 Trench Segment

-2 Water Table Contours

Groundwater Flow Path Toward Trench

NOTES:

1. Water table contours are displayed in feet above mean sea level.
2. Trench capture zones show the paths a hypothetical "particle" (contaminant) would travel based on groundwater flow while the trenches are actively intercepting and removing water (pumping).
3. Water removed by trenches will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
4. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MODPATH File ID Montville10-2trench\Montville10-2.gpr.

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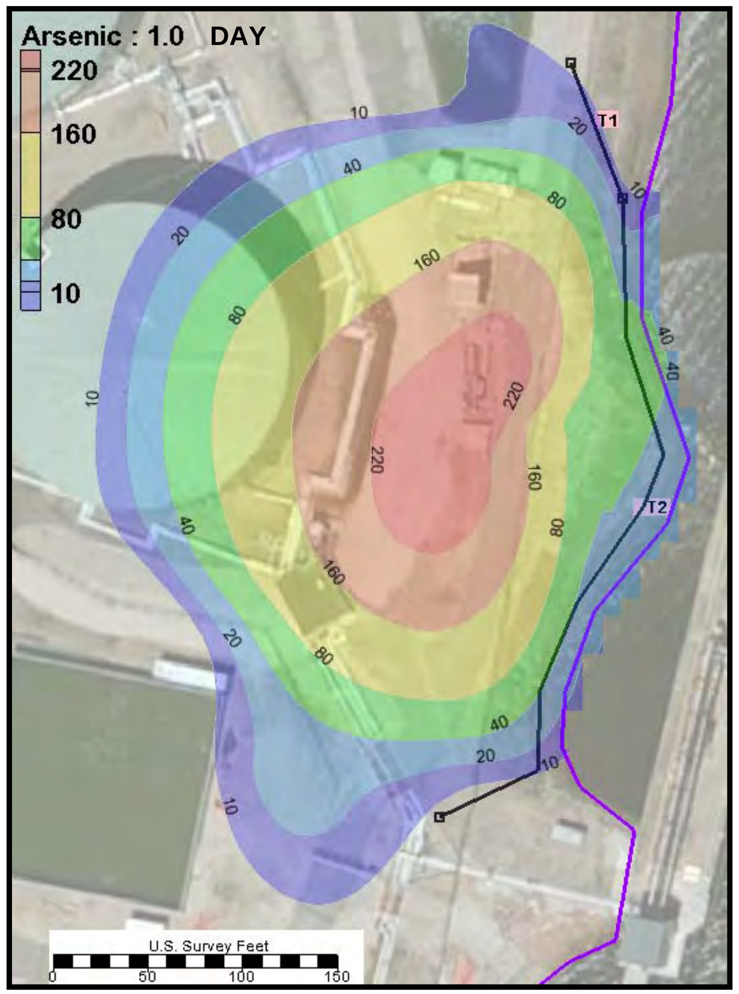
FIGURE 8-6 (SHEET 1 OF 1)

INTERCEPTOR TRENCH FOR HYDRAULIC CONTAINMENT ALTERNATIVE – FLOW INTO TRENCHES UNDER PUMPING CONDITIONS

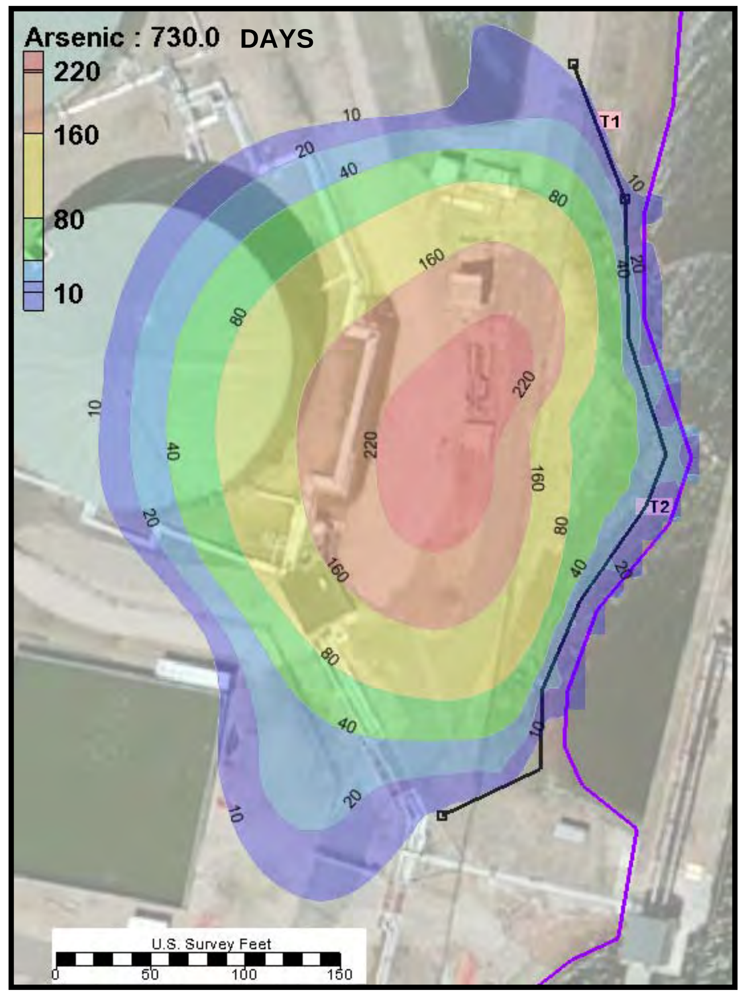
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

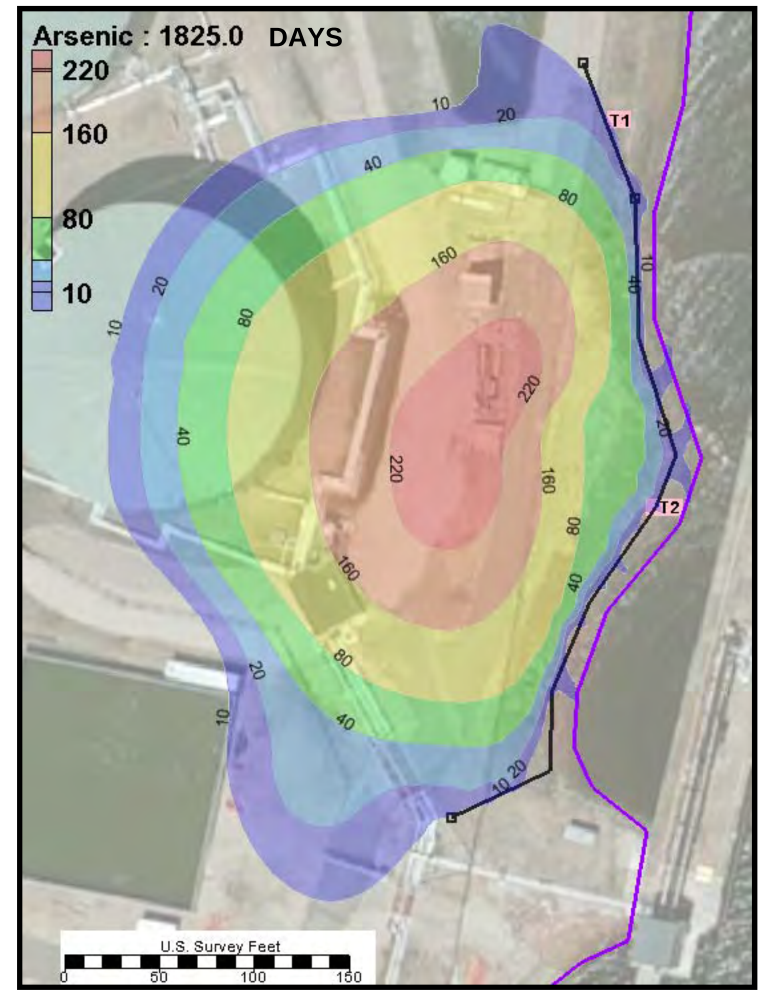
0 Years After Trench Installation



2 Years After Trench Installation



5 Years After Trench Installation



N

LEGEND:

T1 — Trench Segment

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes depths to bottom of trenches are -7 ft above mean sea level and removing water at an overall rate of approximately 107 gallons per minute.
3. Water removed by trenches will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
4. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2trench\Montville10-2.gpr.

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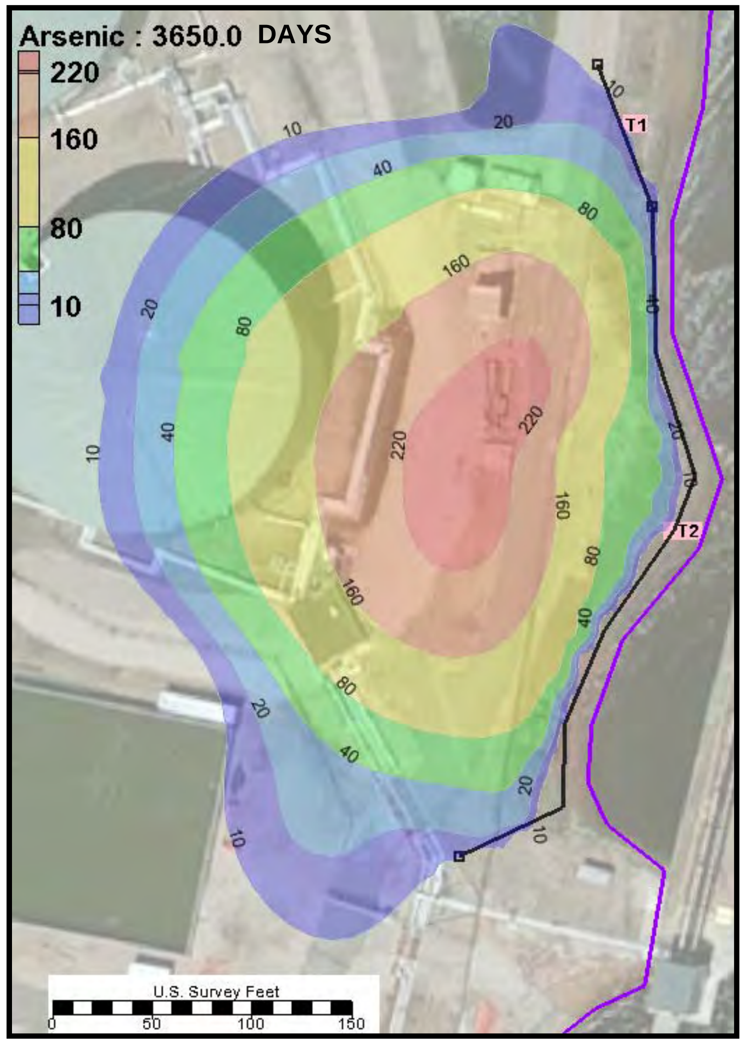
FIGURE 8-7 (SHEET 1 OF 2)

AOC 12 GROUNDWATER MODELING RESULTS FOR INTERCEPTOR TRENCH ALTERNATIVE

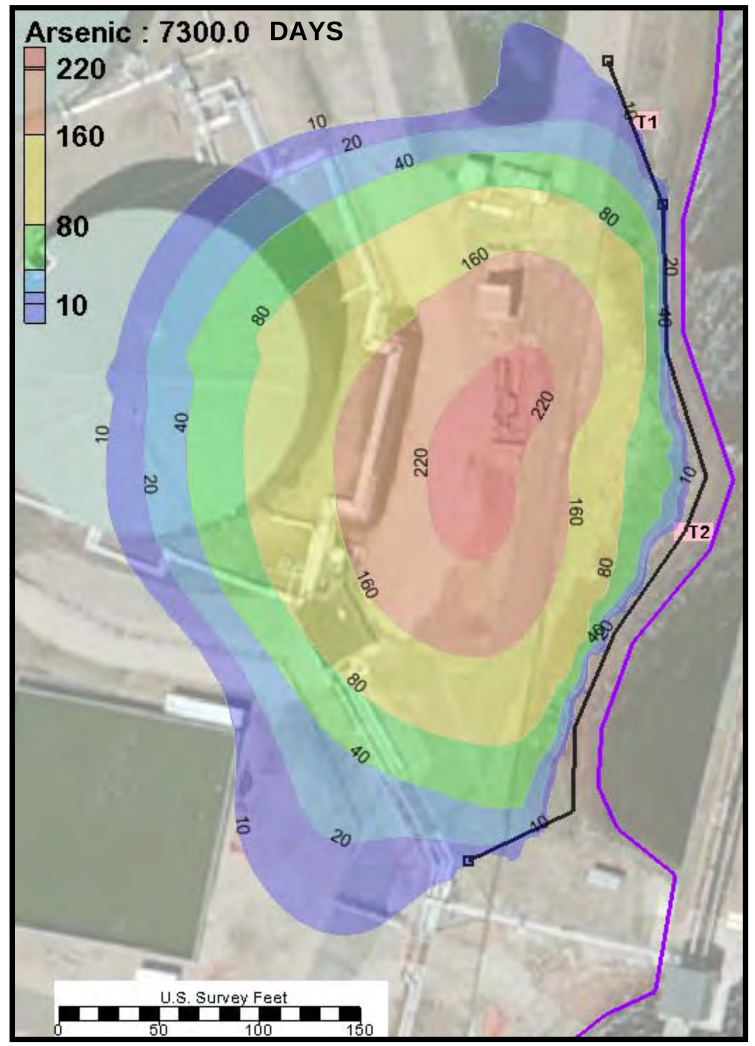
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

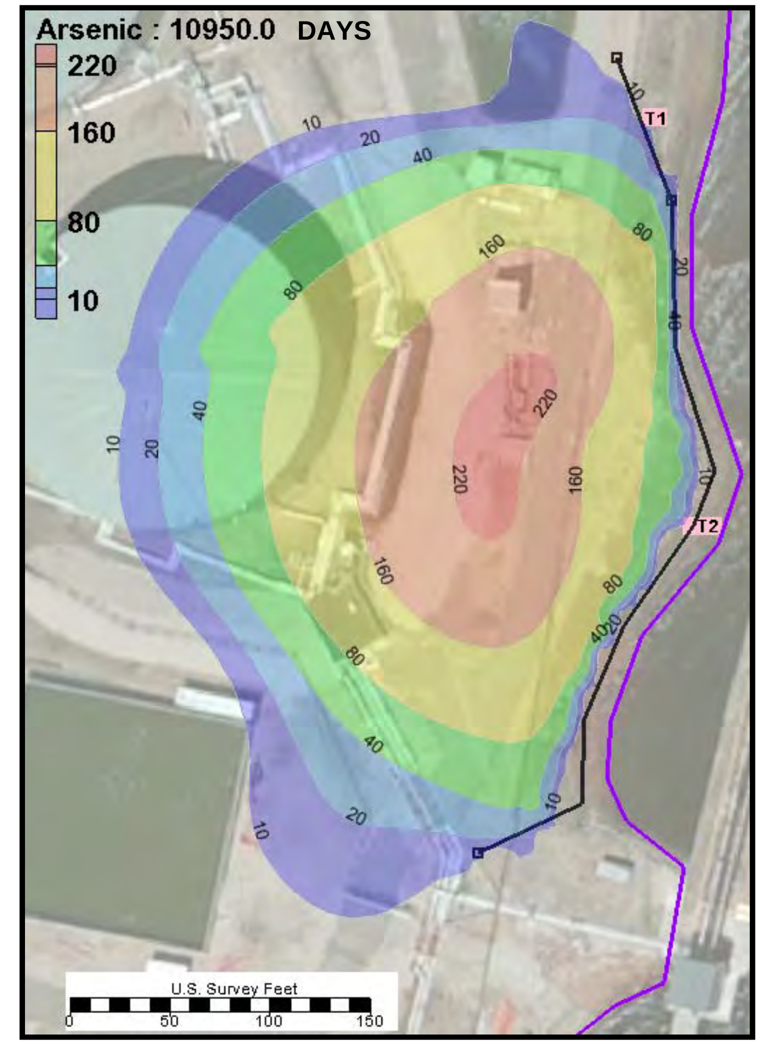
10 Years After Trench Installation



20 Years After Trench Installation



30 Years After Trench Installation



N

LEGEND:

T1 — Trench Segment

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes depths to bottom of trenches are -7 ft above mean sea level and removing water at an overall rate of approximately 107 gallons per minute.
3. Water removed by trenches will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
4. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2trench\Montville10-2.gpr.

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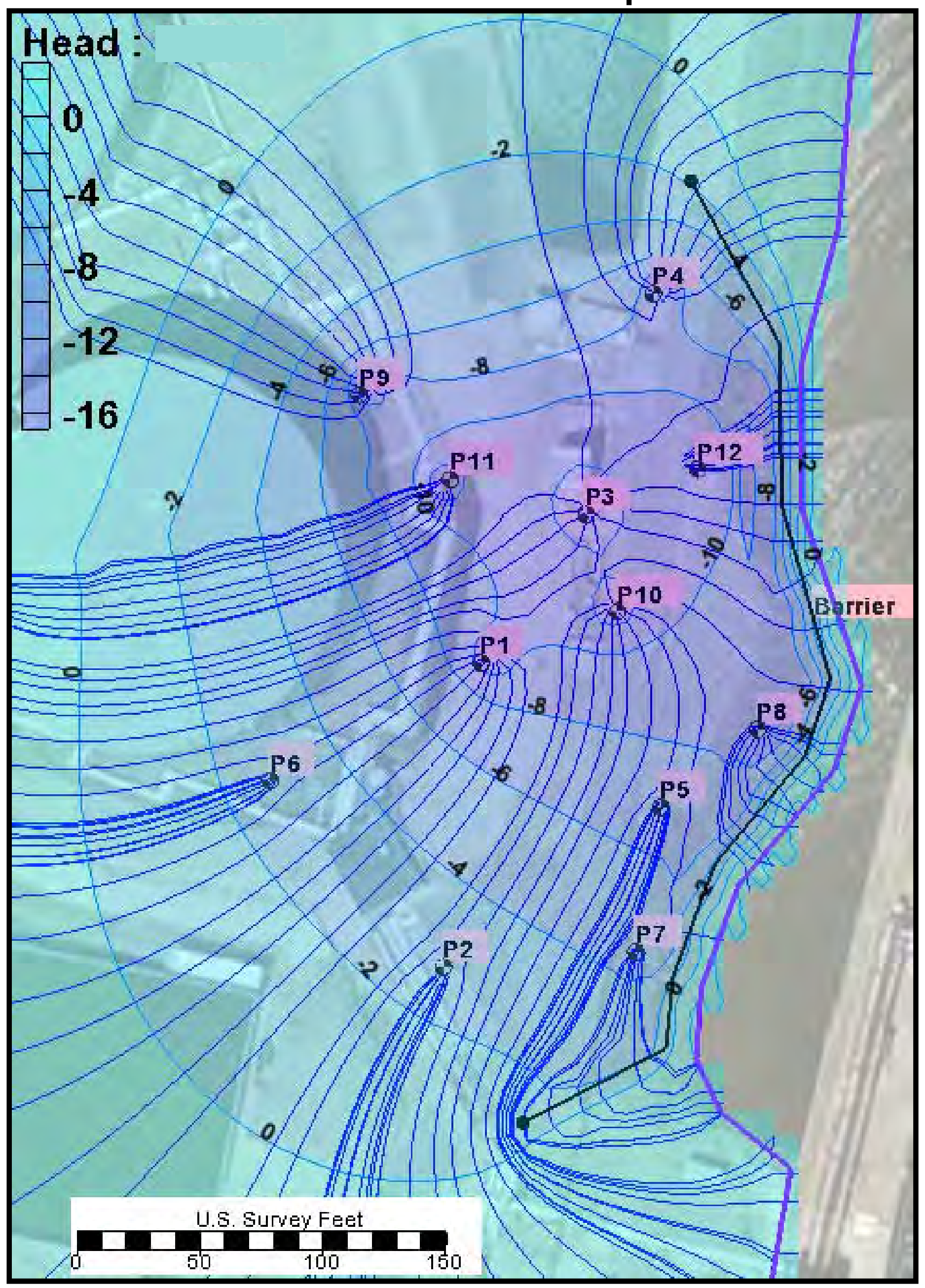
FIGURE 8-7 (SHEET 2 OF 2)

AOC 12 GROUNDWATER MODELING RESULTS FOR INTERCEPTOR TRENCH ALTERNATIVE

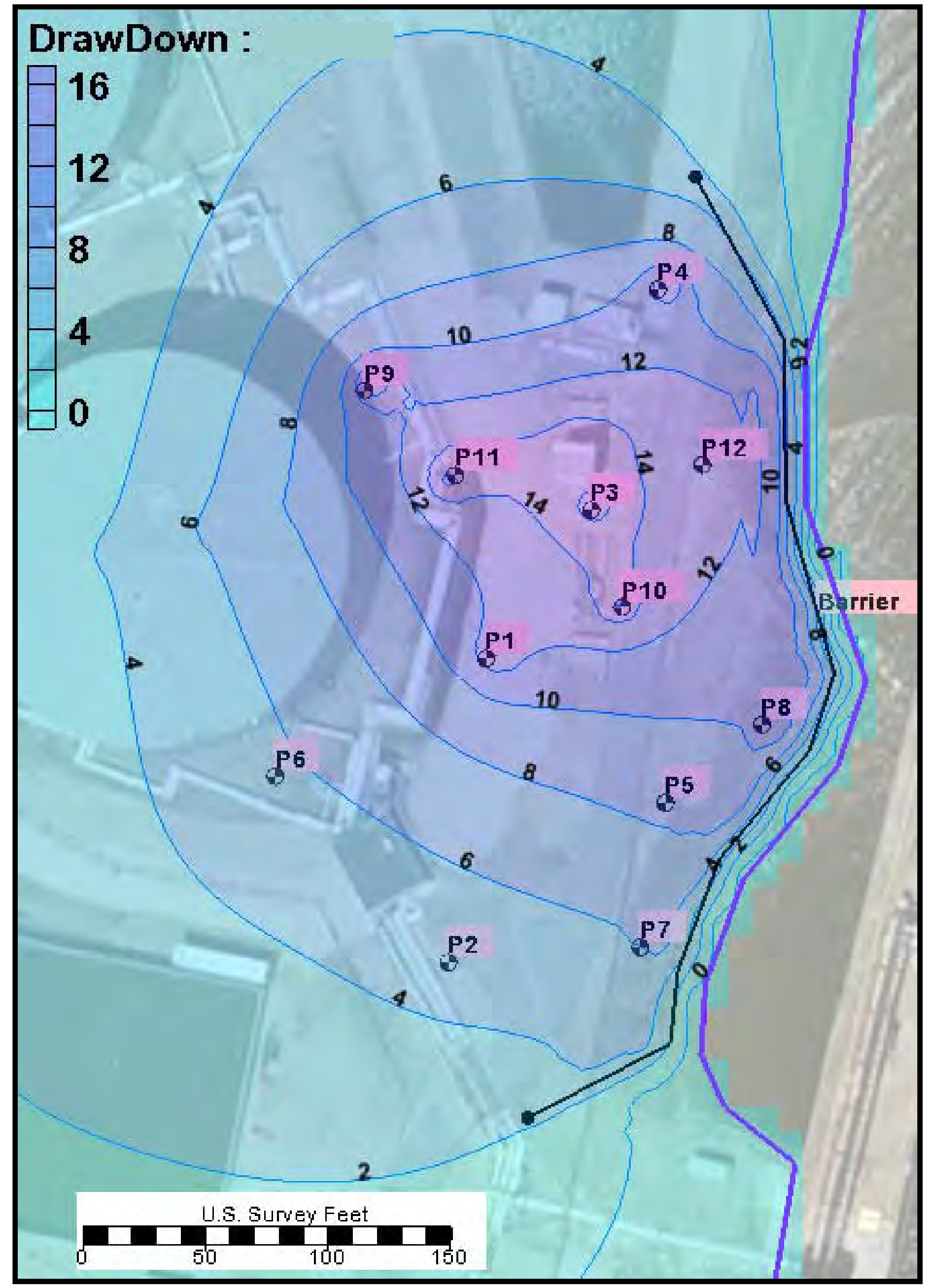
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

Water Table Contours with Well Capture Zones



Extraction Well Drawdown Contours



ID	Pumping Rate (ft/day)	(GPM)
P1	1000	5.19
P2	200	1.04
P3	525	2.73
P4	100	0.52
P5	200	1.04
P6	200	1.04
P7	200	1.04
P8	200	1.04
P9	100	0.52
P10	725	3.77
P11	625	3.25
P12	150	0.78

LEGEND:

P1 Extraction Well ID

-2 Water Table Contours

Groundwater Flow Path Toward Extraction Well

Barrier Wall

NOTES:

1. Water table contours and drawdown are displayed in ft above mean sea level.
2. Well drawdown is the amount the water level drops due to pumping at any given well, compared with the starting groundwater level under non-pumping conditions.
3. Scenario assumes a low hydraulic conductivity (10^{-5} cm/s) barrier along the river.
4. Water removed by extraction well pumping will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
5. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2barrierfewerwells4\Montville10-2.gpr.

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150 ROYALL STREET
CANTON, MA 02021

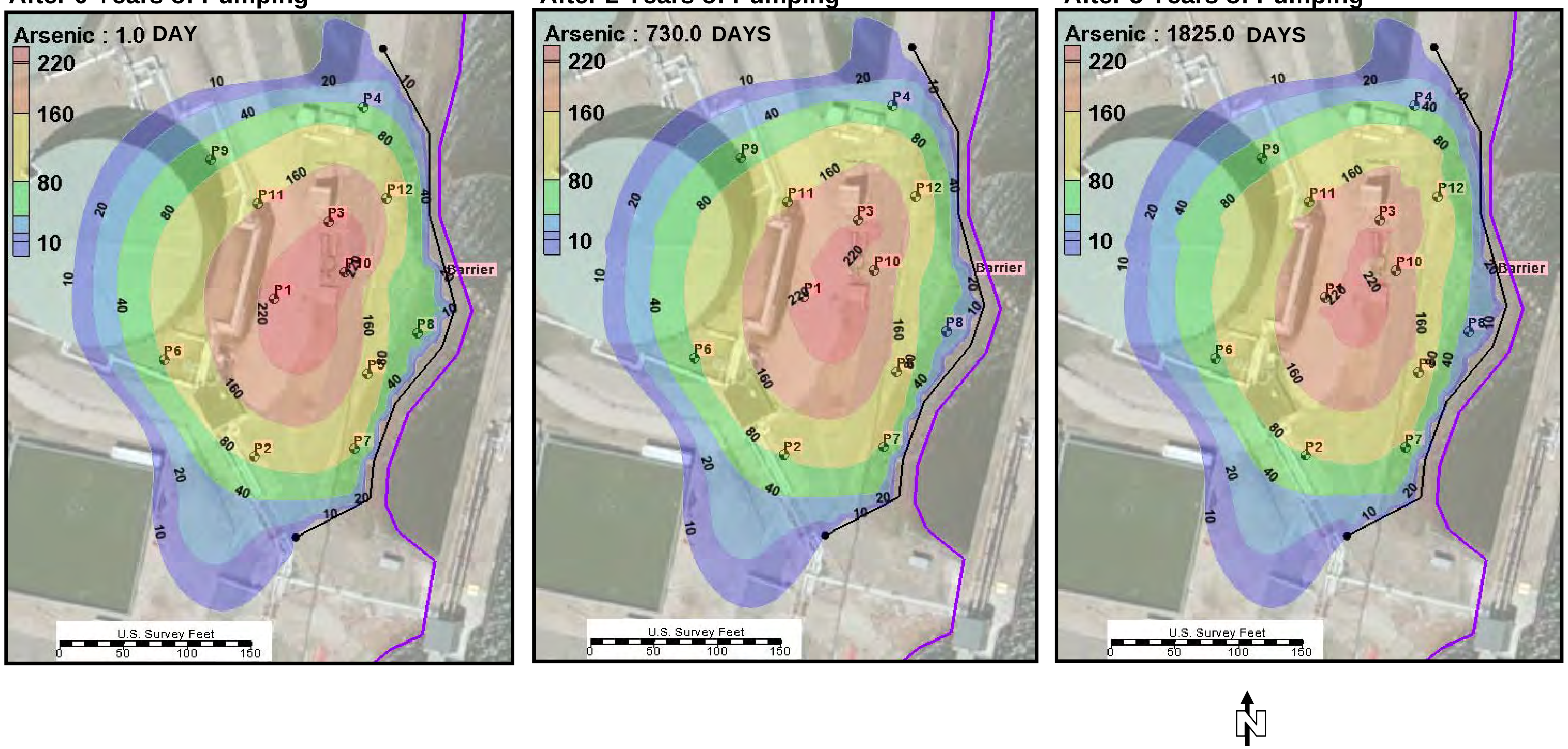
FIGURE 8-8 (SHEET 1 OF 1)

BARRIER WALL WITH MINIMAL PUMPING AND TREATMENT ALTERNATIVE – CAPTURE ZONES

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

After 0 Years of Pumping | After 2 Years of Pumping | After 5 Years of Pumping



LEGEND:

P1 Extraction Well ID

Barrier Wall

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes a low hydraulic conductivity (10^{-5} cm/s) barrier along the river. Starting concentrations at the barrier are assumed to have been reduced to below detection limit during barrier installation.
3. Scenario assumes water removed by extraction well pumping will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
4. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2barrierfewerwells4\Montville10-2.gpr.

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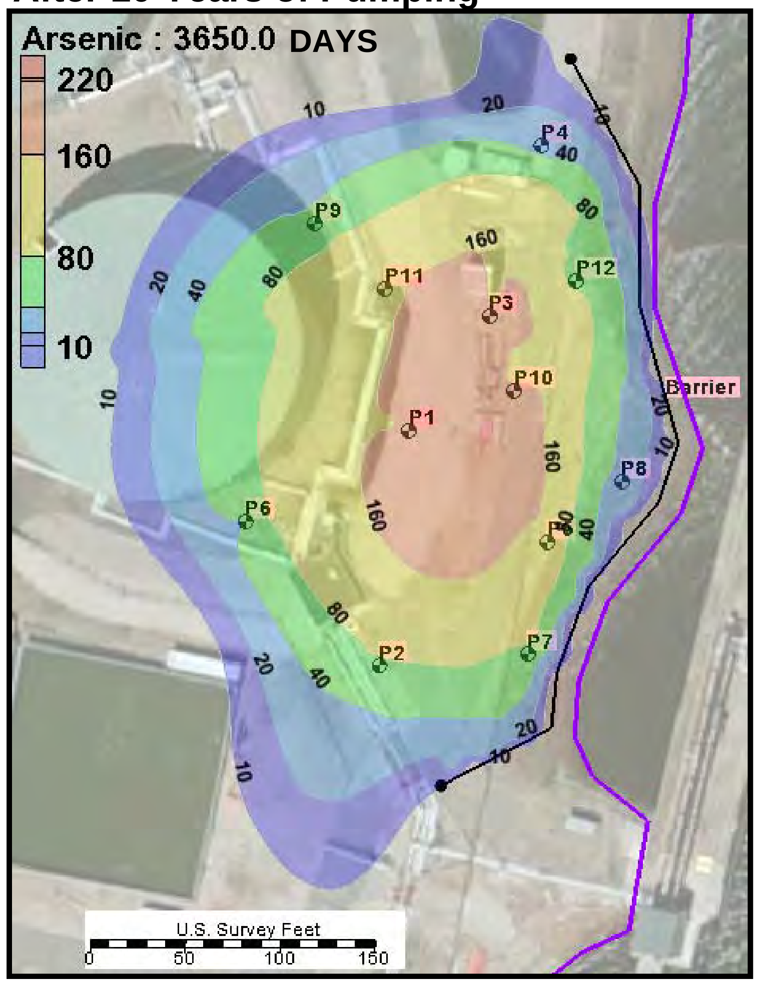
FIGURE 8-9 (SHEET 1 OF 2)

AOC 12 GROUNDWATER MODELING RESULTS FOR BARRIER WALL WITH MINIMAL PUMPING AND TREATMENT ALTERNATIVE

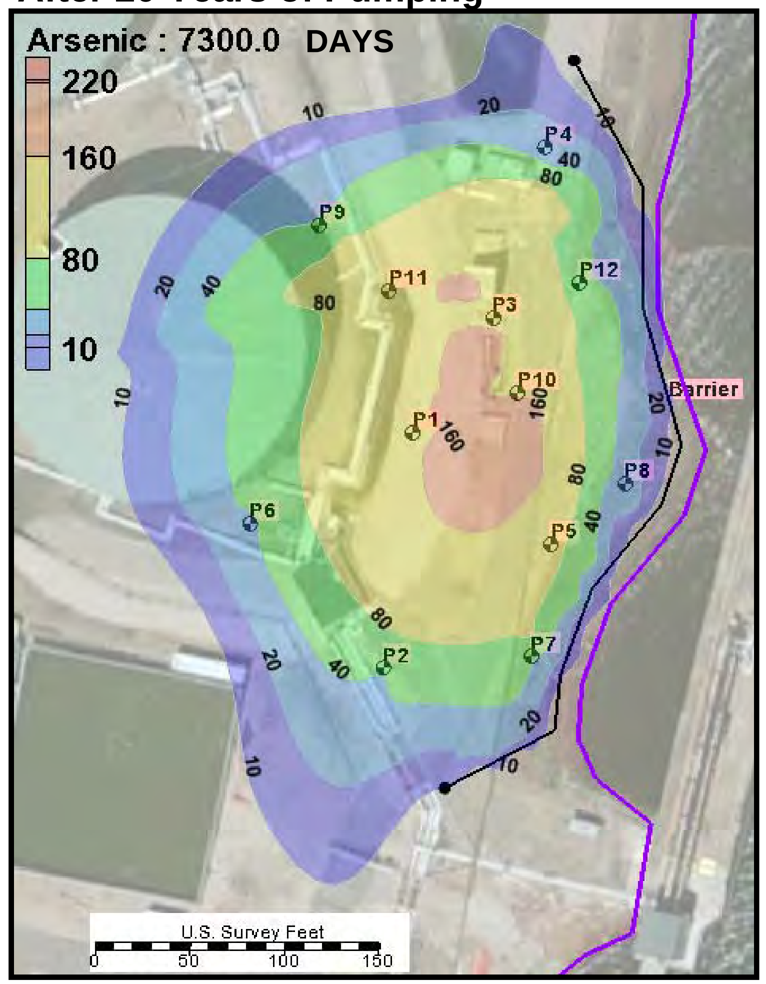
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

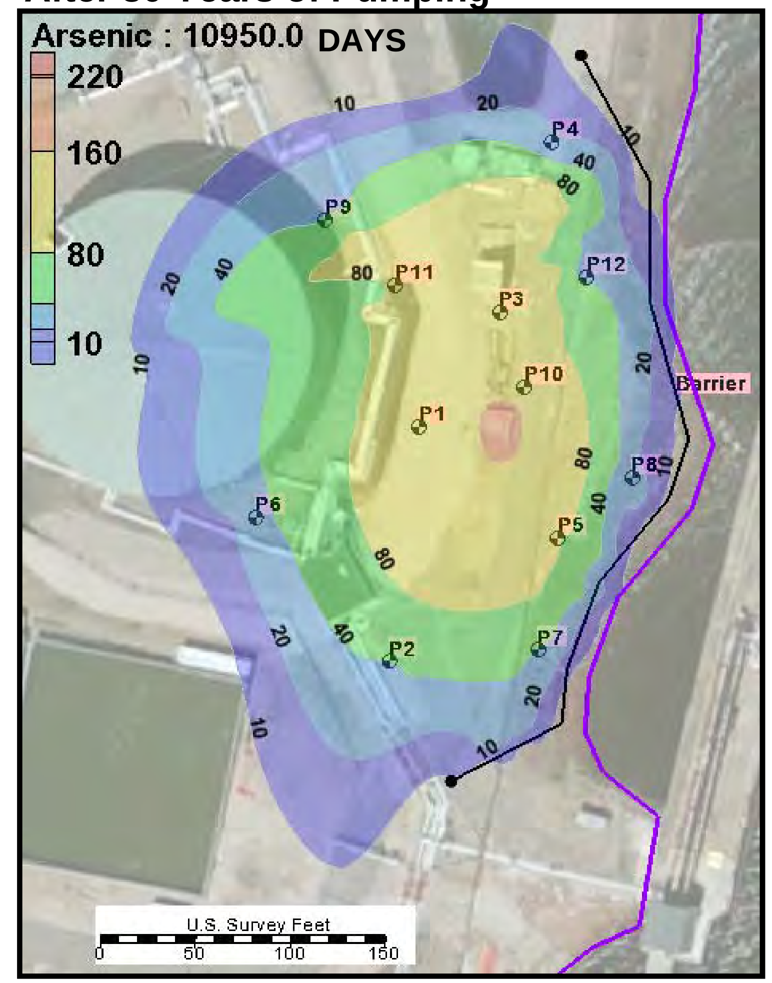
After 10 Years of Pumping



After 20 Years of Pumping



After 30 Years of Pumping



N

LEGEND:

P1 Extraction Well ID

Barrier Wall

NOTES:

1. Arsenic concentrations are displayed in micrograms per liter (µg/L).
2. Scenario assumes a low hydraulic conductivity (10^{-5} cm/s) barrier along the river. Starting concentrations at the barrier are assumed to have been reduced to below detection limit during barrier installation.
3. Scenario assumes water removed by extraction well pumping will be treated ex-situ and will not be re-injected to the local flow system affecting the plume.
4. Information presented on this figure is based on GMS 9.0.3 MODFLOW/MT3DMS File ID Montville10-2barrierfewerwells4\Montville10-2.gpr.

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FIGURE 8-9 (SHEET 2 OF 2)

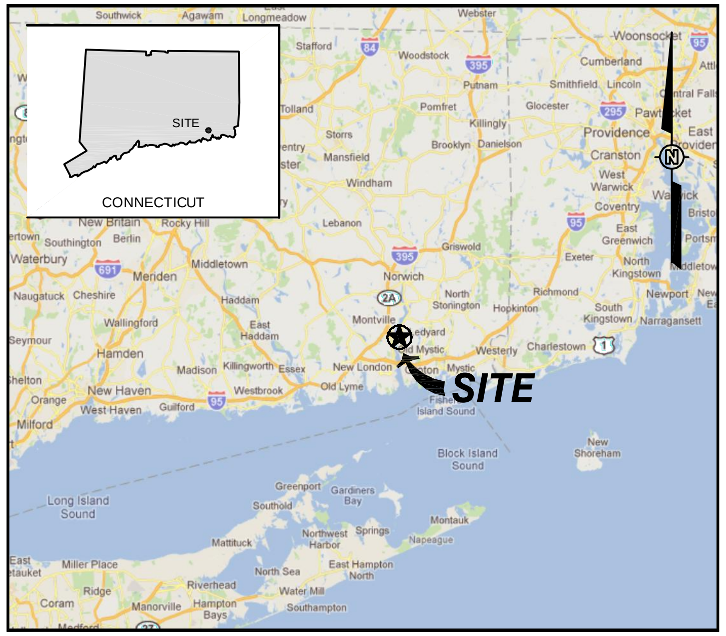
AOC 12 GROUNDWATER MODELING RESULTS FOR BARRIER WALL WITH MINIMAL PUMPING AND TREATMENT ALTERNATIVE

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING RESULTS

NRG ENERGY, INC.
MONTVILLE GENERATING STATION
MONTVILLE & WATERFORD, CONNECTICUT

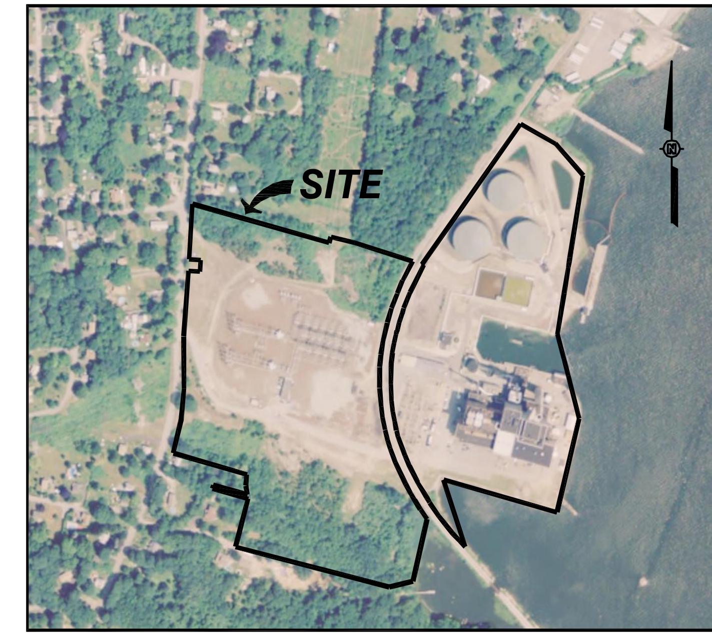
APPENDIX D

Design Drawings



SITE LOCATION MAP

INDEX OF DRAWINGS



SITE VICINITY MAP

SCALE
0 600 1200 FEET

GROUNDWATER REMEDIATION

MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

PREPARED FOR

MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

REV	DESCRIPTION / ISSUE	DATE	APPROVED
0	SENT DRAFT TO NRG FOR REVIEW	1/8/16	AW/PF
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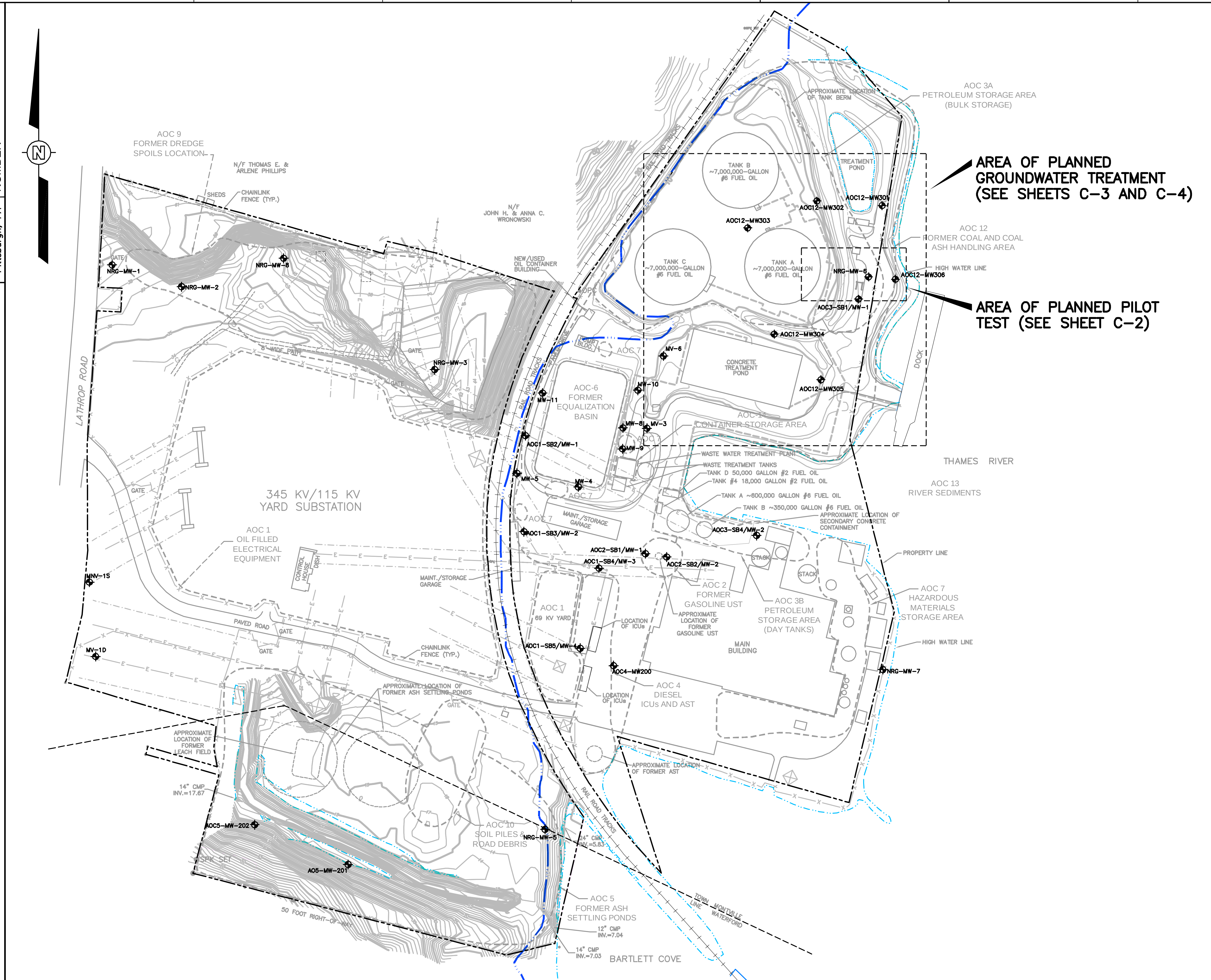
NRG ENERGY, INC.
MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

TITLE SHEET
MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	SCALE:	DRAWING NO.	SHEET NO.
AW/AS	GJ	PF/VT	AW	1/5/16	AS SHOWN	1009644013-T1	T-1

DRAWING NUMBER 1009644013-T1
APPROVED BY --
CHECKED BY --
DRAWN BY --
DESIGNED BY --
DATE --/--/--
OFFICE Pittsburgh, PA

File: O:\Shaw Offices - CAD Files\Stoughton, MA\NRG\Montville\1009644013\1009644013-T1.dwg
Plot Date/Time: Feb 08, 2016 - 1:22pm
Plotted By: greg.jones
Xref:
Image: 1009644007-im1.png CB&I.jpg



LEGEND:

- 100 YEAR FLOOD BOUNDARY
- PROPERTY BOUNDARY
- FUEL OIL PIPING
- FENCE LINE
- TOPOGRAPHIC CONTOUR (56)
- GROUNDWATER MONITORING WELLS (NRG-MW-6)
- WETLAND LINE OR WATER COURSE
- ELECTRICAL TOWER
- OVERHEAD ELECTRIC LINE
- ELECTRIC LINE CLEARANCE AREA
- AREA OF CONCERN (AOC)

REMEDIAL ACTION PLAN SEQUENCE:

1. PERFORM PILOT TEST, (SEE SHEET C-2).
2. PERFORM TB INJECTION (YEAR 1), (SEE SHEET C-3).
3. PERFORM EB INJECTION (YEAR 5), (SEE SHEET C-4).

REFERENCE:

FIRM MAP NO. 09011C0361J REVISED AUGUST 5, 2013.

SCALE
0 200 400 FEET

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MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

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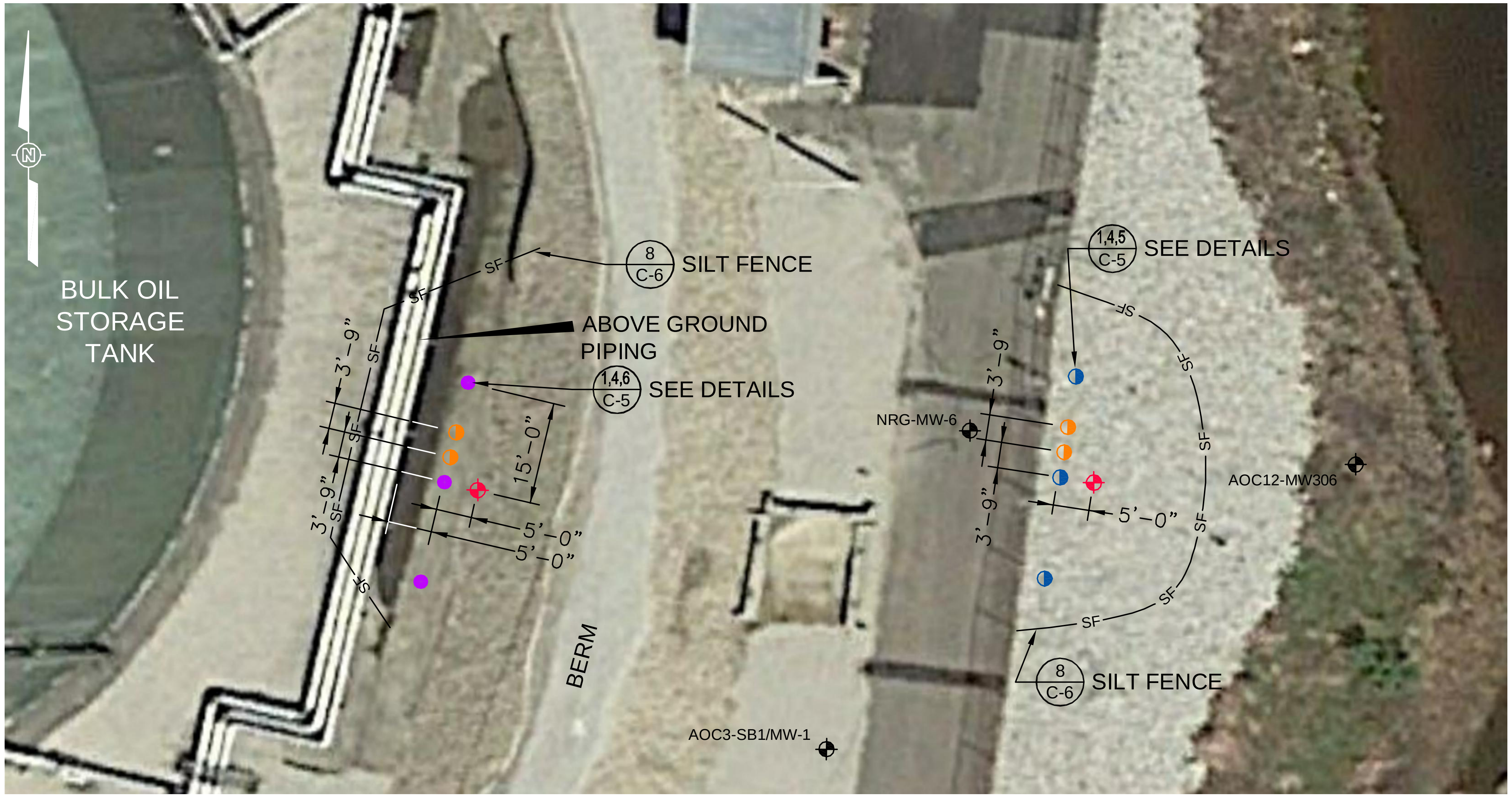
CHECKED BY: PF/VT
APPROVED BY: AW

SITE PLAN - EXISTING CONDITIONS
MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

DATE: 12/3/15 | SCALE: AS SHOWN | DRAWING NO. 1009644013-B1 | SHEET NO. C-1

OFFICE Pittsburgh, PA
DRAWING NUMBER 1009644013-B1



LEGEND:

NRG-MW-6 — EXISTING MONITORING WELLS

PROPOSED:

- MONITORING WELLS
- EB INJECTION WELLS (STICKUP RISER OUTSIDE FENCE)
- TB INJECTION WELLS
- SOIL BORING LOCATIONS (TBD)

CONTRACTOR SEQUENCE:

1. INSTALL 2 GROUNDWATER MONITORING WELLS, ONE DOWNGRADIENT OF EACH LINE OF INJECTION WELLS.
2. INSTALL 3 EACH TB AND EB INJECTION WELLS.
3. SET UP REAGENT MIXING AREA AND MANIFOLD FOR SLURRY INJECTION.
4. INJECT TB SLURRY USING MANIFOLD AT TB INJECTION WELLS. USE APPROXIMATELY 2,800 GALLONS PER WELL TOTAL TO MIMIC YEAR 1 WORK (SEE SHEET C-3).
5. REPEAT WITH EB INJECTION WELLS. USE APPROXIMATELY 2,100 GALLONS PER WELL TOTAL TO MIMIC YEAR 5 WORK (SEE SHEET C-4).
6. REMOVE TEMPORARY WELLHEAD COMPONENTS, MANIFOLD, AND MIXING AREA COMPONENTS.
7. INITIATE SOIL BORING ACTIVITIES TO DETERMINE ROI UPON COMPLETION OF #5.

* EITHER TB OR EB INJECTION WELL SET MAY BE TESTED USING DIRECT INJECTION WITH GEOPROBE AS A COMPARISON TO THE PROPOSED INJECTION METHOD.

NOTES:

1. THE RESULTS OF THE PILOT TEST WILL BE USED TO ADJUST REMEDIAL DESIGN AS NEEDED.
2. GROUNDWATER MONITORING TO BE CONDUCTED AS INDICATED IN THE APPROVED RAP.
3. AN ENVIRONMENTALLY SAFE COLOR TRACER DYE MAY BE ADDED TO THE SLURRY TO AID IN EVALUATION OF PILOT TEST.

SCALE

0 20 40 FEET

REFREENCE:
GOOGLE EARTH IMAGERY DATED: 5/6/2015.

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0	SENT DRAFT TO NRG FOR REVIEW	1/8/16	AW/PF
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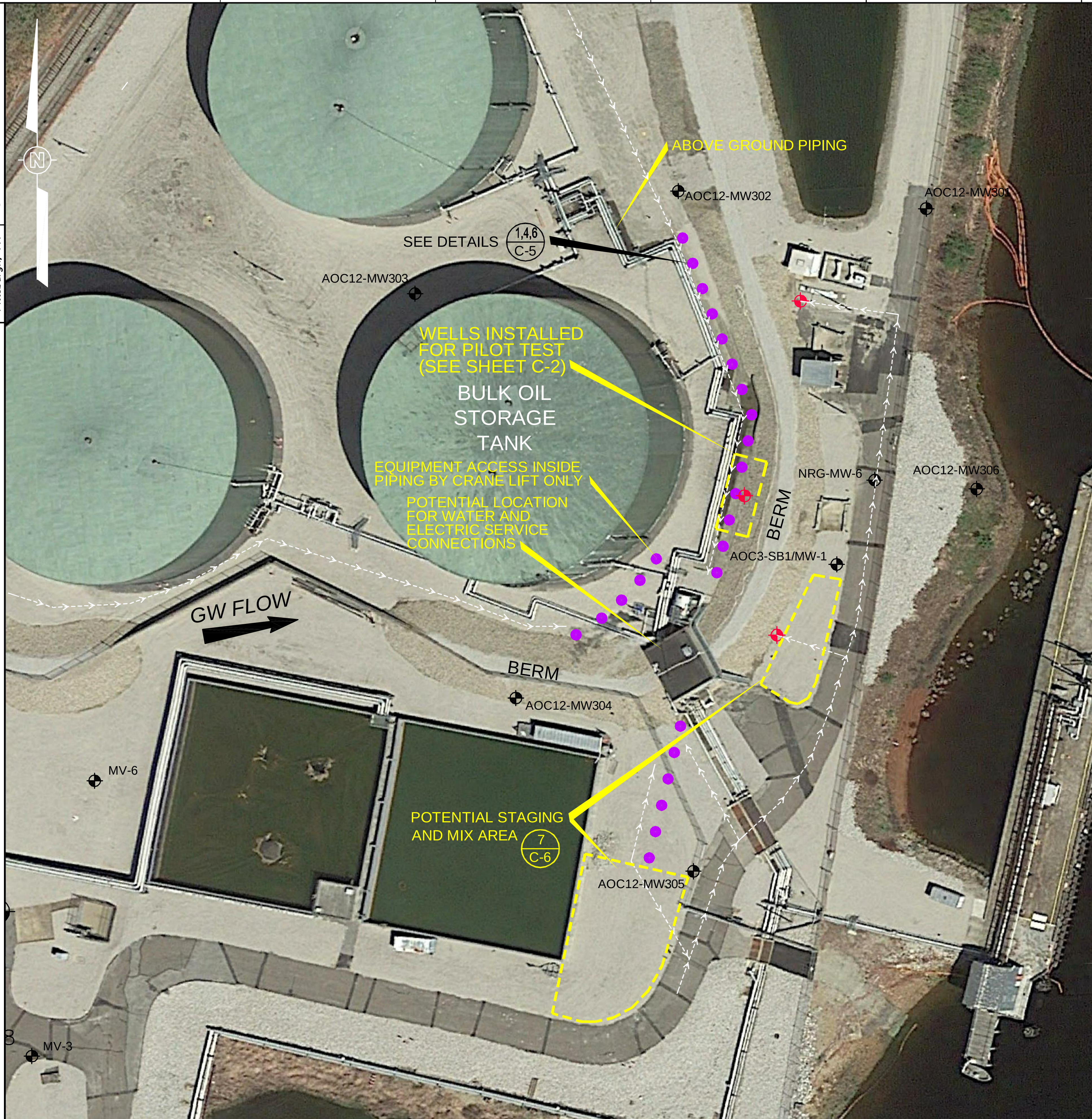
MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

PILOT TEST LAYOUT
MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	SCALE:	DRAWING NO.	SHEET NO.
AW/AS	GJ	PF/VT	AW	1/5/16	AS SHOWN	1009644013-B3	C-2

OFFICE: Pittsburgh, PA
DRAWING NUMBER: 1009644013-B3
VERIFY SCALE 0 1"



LEGEND:

NRG-MW-6 EXISTING MONITORING WELLS

PROPOSED:

MONITORING WELLS

TB INJECTION WELLS

ACCESS ROUTE

YEAR 1 CONTRACTOR SEQUENCE:

1. INSTALL PROPOSED GROUNDWATER MONITORING WELLS.
2. INSTALL REMAINING TB INJECTION WELLS (IF PERMANENT WELLS SELECTED.)
3. SET UP MIXING AREA FOR SLURRY PREPARATION AT 9:1 (VOLUME) USING WATER AND 16 TONS TB AND TRANSPORT REAGENT FROM STORAGE AREA.
4. SET UP DISTRIBUTION PIPING AND MANIFOLD FOR INJECTION. INJECT SLURRY. MOVE MANIFOLD BETWEEN INJECTION WELL GROUPS UNTIL INJECTION COMPLETE AT EACH WELL. USE APPROXIMATELY 2,800 GALLONS OF SLURRY PER WELL TOTAL.
5. REMOVE TEMPORARY WELLHEAD COMPONENTS, MANIFOLD, AND MIXING AREA COMPONENTS.

* ALTERATIVE IS DIRECT INJECTION WITH GEOPROBE

NOTES:

1. CURRENT DESIGN BASED ON SYSTEM PRESSURE OF LESS THAN 100 PSI, ANTICIPATED INJECTION WELL RADIUS OF INFLUENCE OF AT LEAST 7.5 FT. (HALF THE DISTANCE BETWEEN WELLS), SLURRY INJECTION RATE OF 2 GPM OR GREATER, AND MODERATELY EVEN HORIZONTAL AND VERTICAL DISTRIBUTION OF REAGENT ALONG WELL SCREEN INTERVAL (I.E., HOMOGENEOUS SUBSURFACE MATERIAL).
2. GROUNDWATER MONITORING TO BE CONDUCTED AS INDICATED IN THE APPROVED RAP.

SCALE

0 60 120 FEET

REFREENCE:

GOOGLE EARTH IMAGERY DATED: 5/6/2015.

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0	SENT DRAFT TO NRG FOR REVIEW	1/8/16	AW/PF
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NRG ENERGY, INC.
MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

GROUNDWATER TREATMENT AREA
PLAN - TB INJECTION
MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	SCALE:	DRAWING NO.	SHEET NO.
AW/AS	GJ	PF/VT	AW	1/5/16	AS SHOWN	1009644013-B2	C-3

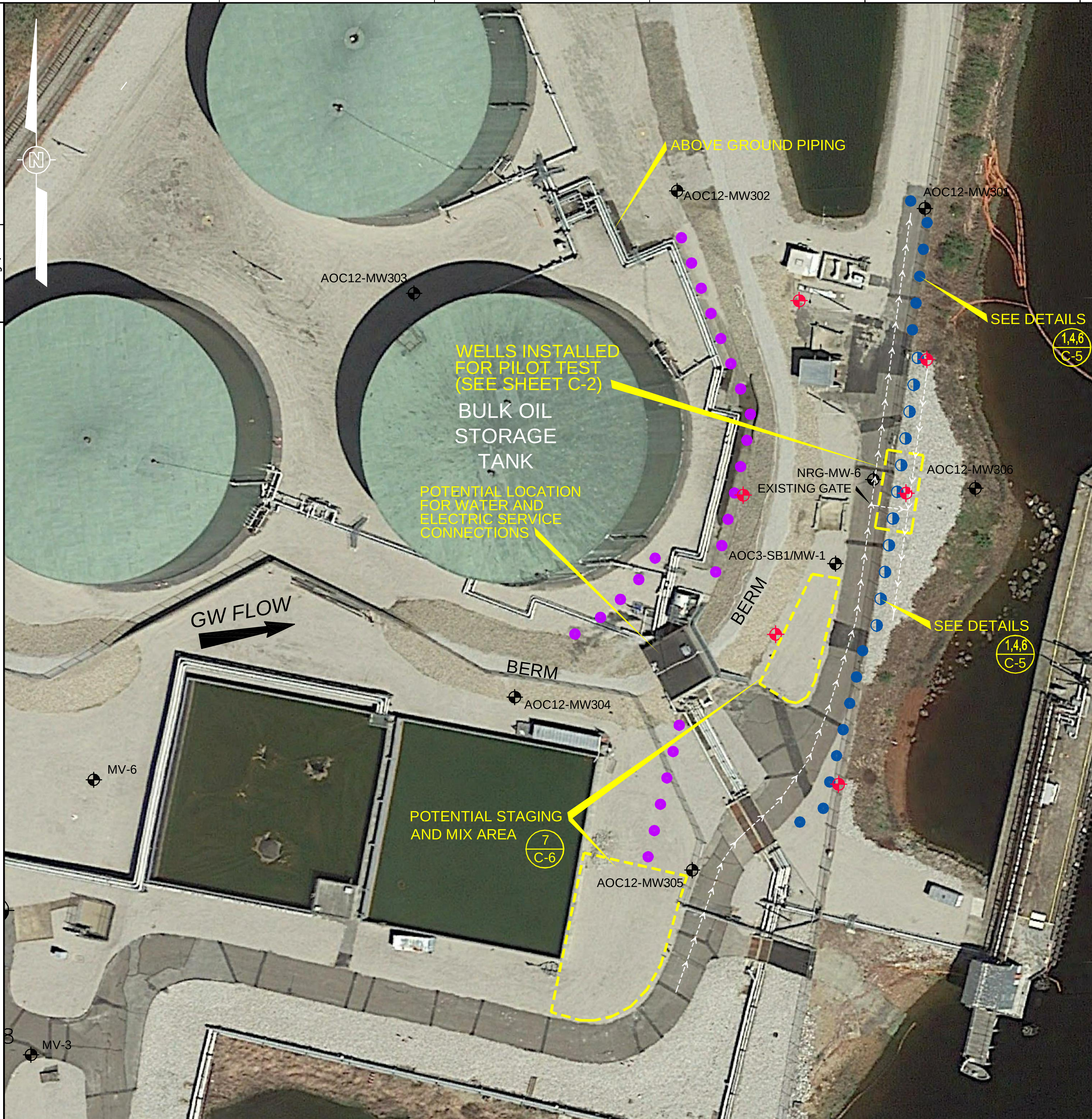
OFFICE Pittsburgh, PA

DRAWING NUMBER 1009644013-B2

VERIFY SCALE

DRAWING NUMBER 1009644013-B7

OFFICE Pittsburgh, PA



VERIFY SCALE 0 1"

LEGEND:

NRG-MW-6 EXISTING MONITORING WELLS

TB INJECTION WELLS (INSTALLED YEAR 1)

PROPOSED:

MONITORING WELLS

EB INJECTION WELLS (FLUSH MOUNT ROAD BOX INSIDE FENCE)

EB INJECTION WELLS (STICKUP RISER OUTSIDE FENCE)

ACCESS ROUTE

YEAR 5 CONTRACTOR SEQUENCE:

1. INSTALL PROPOSED GROUNDWATER MONITORING WELLS.
2. INSTALL REMAINING EB INJECTION WELLS (IF PERMANENT WELLS SELECTED.)
3. SET UP MIXING AREA FOR SLURRY PREPARATION AT 9:1 (VOLUME) USING WATER AND 34 TONS EB AND TRANSPORT REAGENT FROM STORAGE AREA.
4. SET UP DISTRIBUTION PIPING AND MANIFOLD FOR INJECTION. INJECT SLURRY. MOVE MANIFOLD BETWEEN INJECTION WELL GROUPS UNTIL INJECTION COMPLETE AT EACH WELL. USE APPROXIMATELY 2,100 GALLONS PER WELL TOTAL.
5. REMOVE TEMPORARY WELLHEAD COMPONENTS, MANIFOLD, AND MIXING AREA COMPONENTS.

* ALTERATIVE IS DIRECT INJECTION WITH GEOPROBE

NOTES:

1. CURRENT DESIGN BASED ON SYSTEM PRESSURE OF LESS THAN 100 PSI, ANTICIPATED INJECTION WELL RADIUS OF INFLUENCE OF AT LEAST 7.5 FT. (HALF THE DISTANCE BETWEEN WELLS), SLURRY INJECTION RATE OF 2 GPM OR GREATER, AND MODERATELY EVEN HORIZONTAL AND VERTICAL DISTRIBUTION OF REAGENT ALONG WELL SCREEN INTERVAL (I.E., HOMOGENEOUS SUBSURFACE MATERIAL).
2. GROUNDWATER MONITORING TO BE CONDUCTED AS INDICATED IN THE APPROVED RAP.

SCALE

0 60 120 FEET

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2	Issued final to DEEP	2/25/16	AW

REFREENCE:

GOOGLE EARTH IMAGERY DATED: 5/6/2015.

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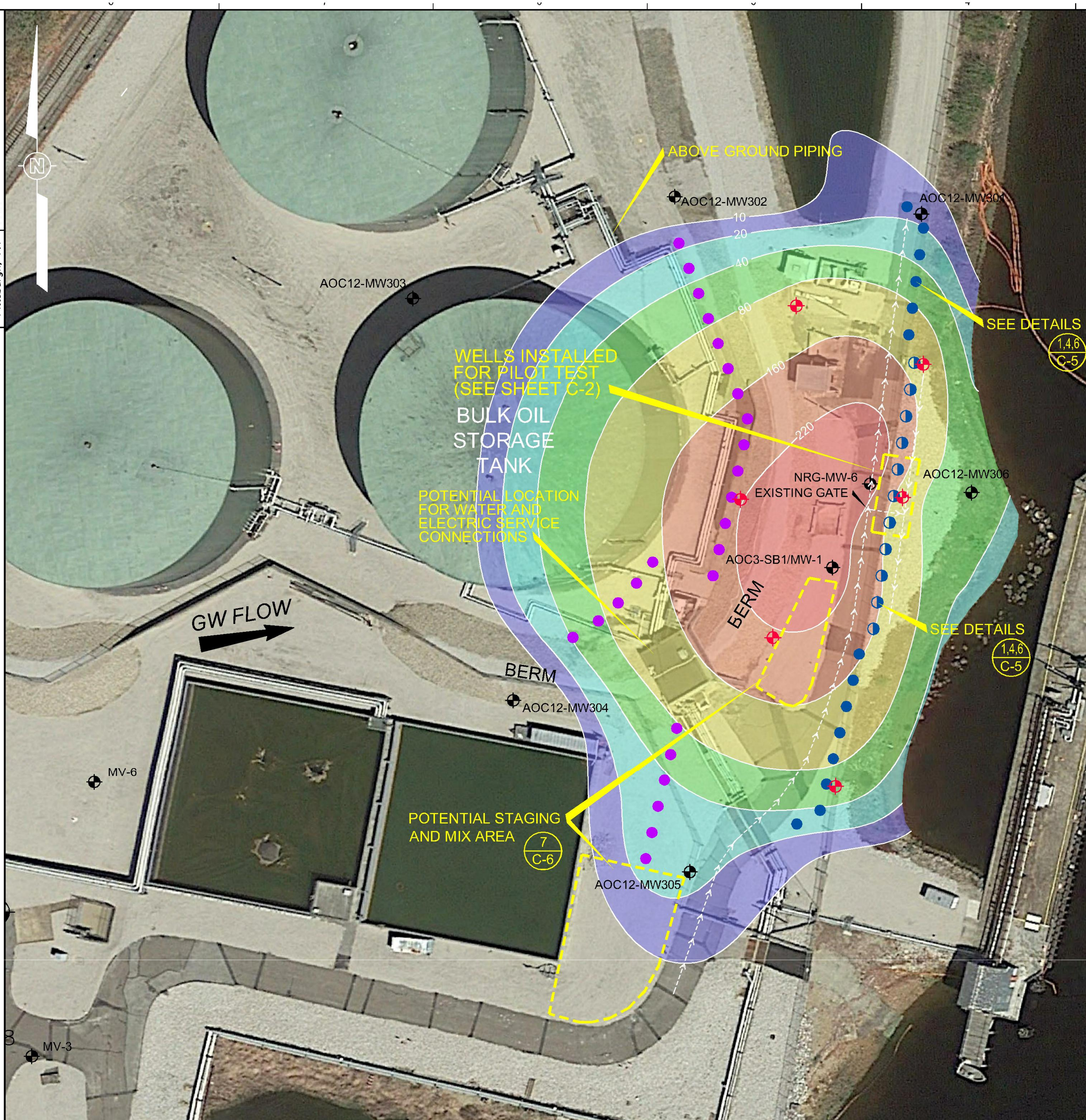
MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

GROUNDWATER TREATMENT AREA
PLAN - EB INJECTION
MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

DATE:	SCALE:	DRAWING NO.	SHEET NO.
1/5/16	AS SHOWN	1009644013–B7	C-4

OFFICE Pittsburgh, PA

DRAWING NUMBER 1009644013-B9



LEGEND:

- NRG-MW-6 EXISTING MONITORING WELLS
- TB INJECTION WELLS (INSTALLED YEAR 1)

PROPOSED:

- MONITORING WELLS
- EB INJECTION WELLS (FLUSH MOUNT ROAD BOX INSIDE FENCE)
- EB INJECTION WELLS (STICKUP RISER OUTSIDE FENCE)
- ACCESS ROUTE

CURRENT CONDITIONS FROM GROUNDWATER MODEL:

- 10–20 ug/L ARSENIC CONCENTRATION
- 20–40 ug/L ARSENIC CONCENTRATION
- 40–80 ug/L ARSENIC CONCENTRATION
- 80–160 ug/L ARSENIC CONCENTRATION
- 160–220 ug/L ARSENIC CONCENTRATION
- 220–240 ug/L ARSENIC CONCENTRATION

NOTE:

REFER TO DRAWING SHEET C-4 FOR EB INJECTION INFORMATION.

DRAFT

S C A L E

0 60 120 FEET

REFREENCE:

GOOGLE EARTH IMAGERY DATED: 5/6/2015.

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DRAWN BY: GJ

CHECKED BY: PF/VT

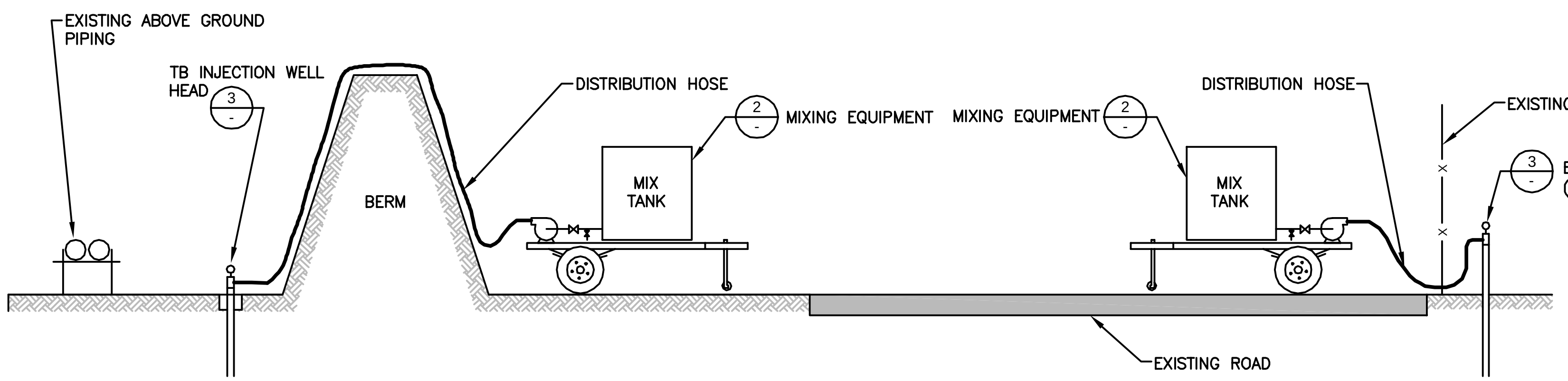
NRG ENERGY, INC.
MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

GROUNDWATER TREATMENT AREA PLAN - ARSENIC CONCENTRATIONS
MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

APPROVED BY:	DATE:	SCALE:	DRAWING NO.	SHEET NO.
AW	1/5/16	AS SHOWN	1009644013-B9	C-7

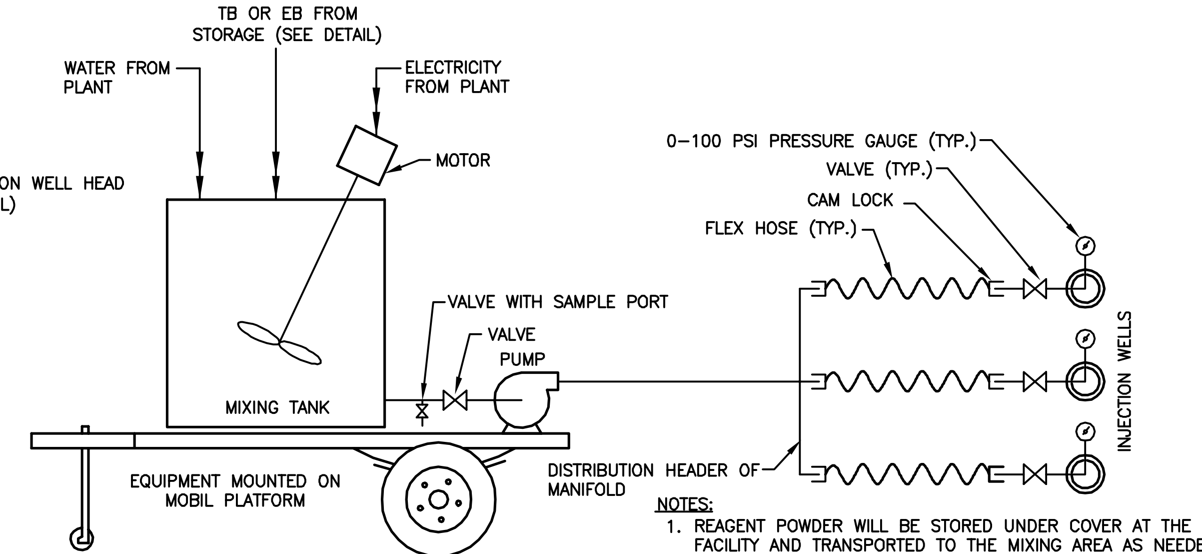
OFFICE Pittsburgh, PA

DRAWING NUMBER 1009644013-B6



DETAIL 1 / C-2,3,4 TYPICAL SECTION MOBIL INJECTION SETUP USING PERMANENT WELLS

N.T.S.

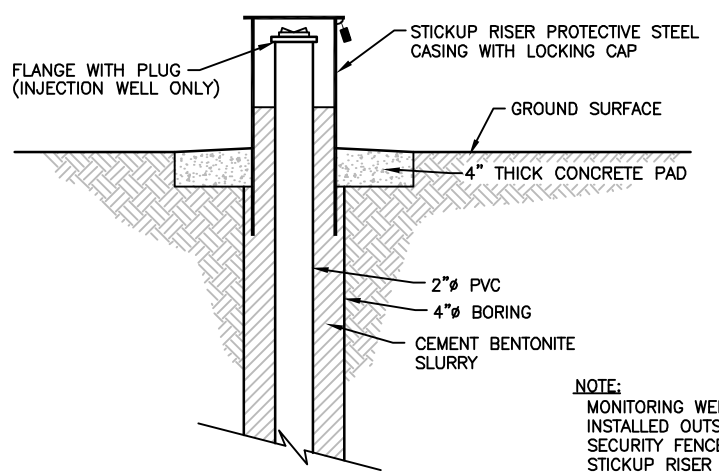


NOTES:

1. REAGENT POWDER WILL BE STORED UNDER COVER AT THE FACILITY AND TRANSPORTED TO THE MIXING AREA AS NEEDED FOR INJECTION EVENTS.
2. WATER AND ELECTRICITY ARE AVAILABLE FROM MULTIPLE LOCATIONS AT THE FACILITY.
3. MIXING AND INJECTION EQUIPMENT TYPE, MATERIAL AND SIZE TO BE DETERMINED BY DRILLING AND INJECTION CONTRACTOR.

DETAIL 2 / - MOBILE INJECTION EQUIPMENT

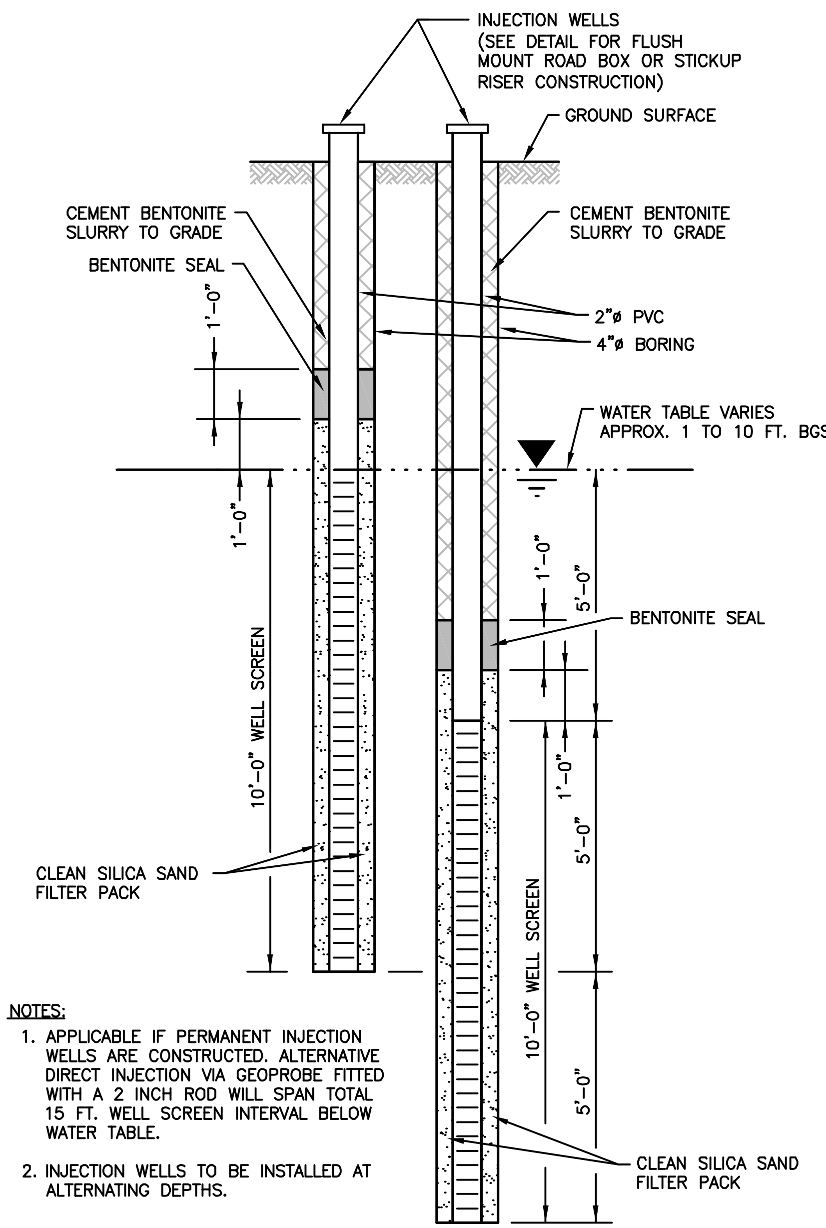
N.T.S.



NOTE:
MONITORING WELLS AND INJECTION WELLS INSTALLED OUTSIDE THE FACILITY PERIMETER SECURITY FENCE WILL BE CONSTRUCTED WITH A STICKUP RISER PROTECTIVE CASING.

DETAIL 5 / C-2 WELL CONSTRUCTION STICKUP RISER

N.T.S.

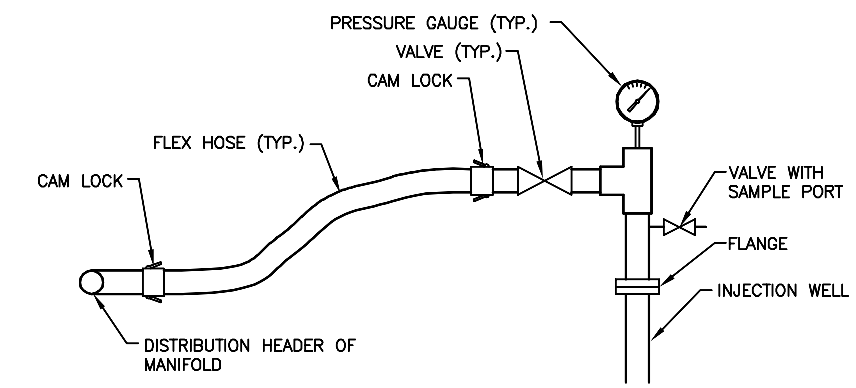


NOTES:

1. APPLICABLE IF PERMANENT INJECTION WELLS ARE CONSTRUCTED. ALTERNATIVE DIRECT INJECTION VIA GEOPROBE FITTED WITH A 2 INCH ROD WILL SPAN TOTAL 15 FT. WELL SCREEN INTERVAL BELOW WATER TABLE.
2. INJECTION WELLS TO BE INSTALLED AT ALTERNATING DEPTHS.

DETAIL 4 / C-2,3,4 INJECTION WELL CONSTRUCTION ALTERNATING DEPTH

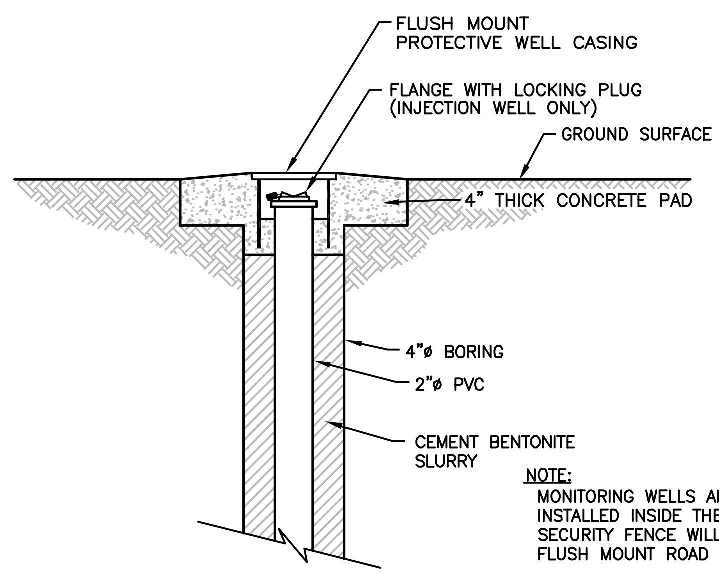
N.T.S.



NOTE:
COMPONENTS SHOWN ABOVE FLANGE ARE TEMPORARY AND WILL BE INSTALLED BEFORE AND REMOVED AFTER INJECTION. INJECTION WELL WILL BE PLUGGED WHEN NOT IN USE.

DETAIL 3 / - INJECTION WELL HEAD

N.T.S.



NOTE:
MONITORING WELLS AND INJECTION WELLS INSTALLED INSIDE THE FACILITY PERIMETER SECURITY FENCE WILL BE CONSTRUCTED WITH A FLUSH MOUNT ROAD BOX.

DETAIL 6 / C-2,3,4 WELL CONSTRUCTION FLUSH MOUNT ROAD BOX

N.T.S.

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2	Issued final to DEEP	2/25/16	AW

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DRAWN BY: GJ
CHECKED BY: PF/VT
APPROVED BY: AW

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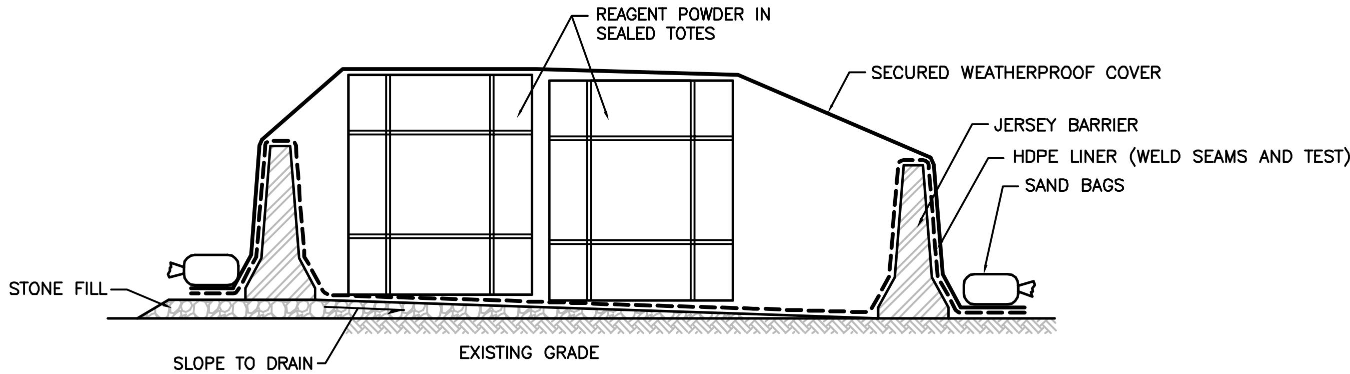
MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

DETAILS
(SHEET 1 OF 2)
MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

DATE:	SCALE:	DRAWING NO.	SHEET NO.
1/5/16	AS SHOWN	1009644013–B6	C-5

DRAWING NUMBER 1009644013-B8

OFFICE Pittsburgh, PA

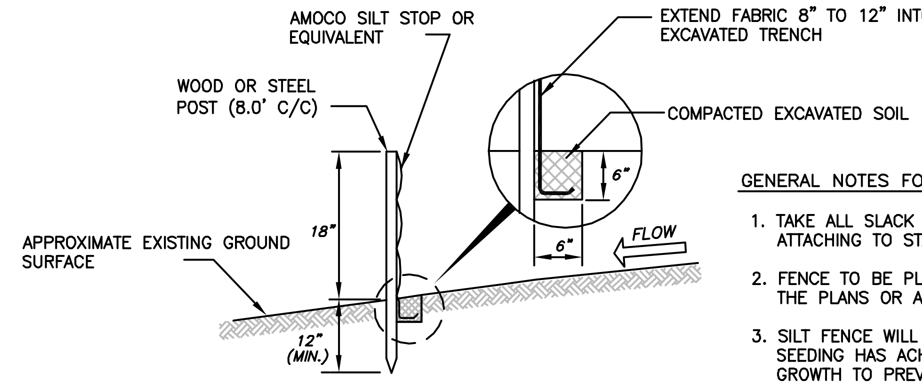


NOTE:

TEMPORARY STORAGE ONLY USED IN PREPARATION FOR INJECTION OR DURING INJECTION AND NOT INTENDED FOR LONG TERM STORAGE.

DETAIL 7/C-3,4 TEMPORARY REAGENT STORAGE

N.T.S.



GENERAL NOTES FOR SILT FENCE INSTALLATION:

1. TAKE ALL SLACK OUT OF FABRIC BEFORE ATTACHING TO STAKES.
2. FENCE TO BE PLACED AS SHOWN ON THE PLANS OR AS OTHERWISE DIRECTED.
3. SILT FENCE WILL BE REMOVED AFTER SEEDING HAS ACHIEVED ADEQUATE GROWTH TO PREVENT EROSION OR AS OTHERWISE DIRECTED.
4. FOLLOW ADDITIONAL PROCEDURES FOUND IN THE TECHNICAL SPECIFICATIONS.

DETAIL 8/C-2 SILT FENCE INSTALLATION

N.T.S.

VERIFY SCALE 0 1"

REV	DESCRIPTION / ISSUE	DATE	APPROVED
0	SENT DRAFT TO NRG FOR REVIEW	1/8/16	AW/PF
1	MINOR TEXT EDITS, ADDED C-7, ISSUED DRAFT TO NRG FOR REVIEW	2/9/16	AS
2	Issued final to DEEP	2/25/16	AW

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NRG ENERGY, INC.
MONTVILLE POWER LLC
UNCASVILLE, CONNECTICUT

DETAILS
(SHEET 2 OF 2)
MONTVILLE GENERATING STATION
MONTVILLE, CONNECTICUT

DESIGNED BY:	AW/AS
DRAWN BY:	GJ
CHECKED BY:	PF/VT
APPROVED BY:	AW
DATE:	1/5/16
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